

## **Exhibit A**

Copy of 49 Fed. Reg. 49252, dated December 18, 1984

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Tuesday  
December 18, 1984

## Part IV

## Department of the Interior

### Bureau of Land Management

#### 43 CFR Part 4700

Protection, Management, and Control of  
Wild Free-Roaming Horses and Burros;  
Revision of Existing Regulations;  
Proposed Rule

000001

**DEPARTMENT OF THE INTERIOR****Bureau of Land Management****43 CFR Part 4700****Protection, Management, and Control of Wild Free-Roaming Horses and Burros; Revision of Existing Regulations****AGENCY:** Bureau of Land Management, Interior.**ACTION:** Proposed rulemaking.

**SUMMARY:** This proposed rulemaking revises the provisions on wild free-roaming horses and burros in Part 4700 to reduce the regulatory burden on the public, to clarify the management procedures of the Bureau of Land Management as they affect the public, to remove unnecessary self-regulating provisions, and to arrange the regulations by subject.

**DATE:** Comment period expires February 19, 1985. Comments received or postmarked after this date may not be considered in the decisionmaking process on a final rulemaking.

**ADDRESS:** Comments should be sent to: Director (140), Bureau of Land Management, 1800 C Street, NW., Washington, D.C. 20240.

Comments will be available for public review in Room 5555 of the above address during regular business hours (7:45 a.m. to 4:15 p.m.), Monday through Friday.

**FOR FURTHER INFORMATION CONTACT:** John S. Boyles, (202) 653-9215.

**SUPPLEMENTARY INFORMATION:** This proposed rulemaking completely revises Part 4700 of Title 43 of the Code of Federal Regulations. The regulations are completely reorganized to group provisions on the same subject into the same subpart. Redundant sections, obsolete definitions and provisions, and terms or provisions not authorized by law have been removed. Changes have been made to ease cumbersome and burdensome requirements on the public as much as possible, and provisions not affecting the public have been removed, to be included in the Manual of the Bureau of Land Management (BLM) where appropriate.

In the proposed rulemaking, §§ 4700.0-1, 4700.0-2 and 4700.0-6 have been rewritten to describe purpose, objectives and policy more specifically, and to inform the public of the bases for procedures and requirements contained in the regulations. The proposed rulemaking states as a matter of policy that the authorized officer, in administering the program, shall consult with Federal and State wildlife agencies

and all other affected interests. Because this policy applies to all aspects of the wild free-roaming horse and burro program, the requirement for consultation has been removed from all other sections of the proposed rulemaking as a needless duplication. Amendments are proposed in the Definitions, § 4700.0-5, to clarify the meaning of some terms used in the regulations, to remove definitions that duplicate text contained elsewhere in the Part, and to remove terms whose use is obsolete or not authorized, or that are self-explanatory. The term "free-roaming" has been removed from several definitions and other provisions referring to "wild horses and burros," and is used in this proposed rulemaking to refer only to animals remaining at large and not in private maintenance.

The proposed rulemaking removes provisions that give procedural guidance and instruction to BLM personnel and do not affect the public. Any such provisions that contain information that may be useful to the public have been incorporated in the proposed rulemaking in the appropriate sections. Pertinent removed provisions will be included in the BLM Manual.

The proposed rulemaking amends existing Subpart 4730 as new Subpart 4710 to link the management of wild free-roaming horses and burros with the Bureau's planning system; to identify precisely the lands that will be considered for wild horse and burro management; to require that hard management area plans be prepared for all herd management areas; to allow the authorized officer to protect wild horses and burros and their habitat by closing certain lands to all or particular kinds of livestock grazing or by removing unauthorized livestock; to require that public lands inhabited by wild horses and burros be closed to grazing by domestic horses and burros; and to allow private landowners to maintain wild horses and burros on their land, so long as the animals are not enticed or removed to such land and are not detained there.

Subpart 4720 of the proposed rulemaking states the circumstances under which straying or excess wild horses and burros are to be removed from public and private lands, and the procedures for removing them.

The proposed regulations are reorganized and consolidated by subject matter. Although four new subparts—Destruction of Wild Horses and Burros, and Disposal of Carcasses (Subpart 4730), Motor Vehicles and Aircraft (Subpart 4740), Private Maintenance (Subpart 4750), and Compliance (Subpart 4760)—have been added,

consolidation of the regulations and the elimination of unnecessary, unauthorized and obsolete provisions have reduced the length and complexity of the regulations. The new subparts incorporate the existing rules to the extent that they remain applicable, and add language where necessary to clarify requirements. For example, in Subpart 4740, explicit standards for vehicles are set forth to ensure the safe transport of wild horses and burros both by BLM personnel and by members of the public obtaining the animals for private maintenance.

New Subpart 4750 expands the existing regulations to incorporate all the requirements for private maintenance and adoption of wild horses and burros, including the requirement for adoption fees, qualification standards, conditions for the care and treatment of animals being maintained privately, and the replacement, under certain conditions, of animals that die during private maintenance.

Proposed Subpart 4730 consolidates the existing regulations on destruction of certain wild horses and burros and makes clear the limitations on methods of destruction. Section 4730.2, Disposal of Carcasses, is designed to avoid conflicts between Federal practices and State or local sanitation laws. The provision prohibiting receipt of compensation by a person disposing of a carcass is not intended to prohibit the sale of horse products by rendering plants, but rather only to prohibit the sale of animals to such plants and to discourage their slaughter for consumptive use.

The proposed regulations are written to alleviate regulatory burdens on persons who privately maintain wild horses and burros. The existing regulations, at § 4740.4-2(f), require the adopter to obtain a written statement from a veterinarian within 7 days of the death of an adopted animal. The proposed rulemaking would require only that the adopter notify the authorized officer within 7 days of the discovery of the death, escape or theft of an animal. The authorized officer then has discretion to investigate the circumstances of death and is required to investigate escape or theft. This modified provision will be less costly to the adopter and will encourage the adopter to report problems promptly. By starting the notification period on the date of discovery, the proposed rulemaking adds flexibility to cover cases where the problem is not discovered within 7 days of its occurrence, for whatever reason.

Section 4740.5(a) of the existing regulations limits the transfer of title to four animals per year per applicant. Section 4750.5(a) of the proposed rulemaking allows adopters credit for humane treatment of animals during the years before title was first offered in 1980. By accumulating credit for care at the rate of four horses or burros per year, an adopter can obtain title to more than four animals in the current year based on proper care of animals maintained privately during the 1970's. The limit is four animals for each year of such care.

Section 4740.5(b) of the proposed rulemaking modifies the requirement in § 4740.5(b) of the existing regulations for a veterinarian's certification that privately maintained horses and burros are receiving proper care and treatment. It allows such certification to be made by any qualified person, such as a cooperative extension agent, humane officer or the authorized officer of the Bureau of Land Management. Such officials are equally capable of providing the necessary certificate, and may be more familiar with the individual animal. The new process may be more convenient and less expensive for the adopter.

The proposed rulemaking deletes certain requirements not supported by law. References to "problem animals," a requirement that slaughterhouses retain title for 1 year after slaughtering, a prohibition of accepting an animal for slaughter without a Certificate of Title, and a provision that a private landowner may request that the BLM remove wild horses and burros only from fenced land, have all been eliminated. There is no reference in the law to "problem animals"; there is no legal justification for Federal control of animals once title passes; and a Federal District Court in Oregon has ruled that the requirement that animals shall be removed by the Federal Government only from fenced private land is unsupported by law, and that slaughterhouses need not obtain a Certificate of Title.

The principal author of this proposed rulemaking is John S. Boyles, Division of Wild Horses and Burros, assisted by the staff of the Office of Legislation and Regulatory Management, Bureau of Land Management.

It is hereby determined that this rulemaking does not constitute a major Federal action significantly affecting the quality of the human environment and that no detailed statement pursuant to section 102(2)(C) of the National

Environmental Policy Act of 1969 (42 U.S.C. 4332(2)(C)) is required. The Department of the Interior has determined that this document is not a major rule under Executive Order 12291 and that it will not have a significant economic effect on a substantial number of small entities under the Regulatory Flexibility Act (5 U.S.C. 601 et seq.). A limited number of veterinarians, cooperative extension agents and human officials may be insignificantly affected by the rulemaking. The certification required for adopters to receive title is needed on a nonrecurring basis. The changes allow adopters flexibility in choosing the official from whom they obtain a certification, resulting in some cost-savings. Adopters are required to pay a fee to obtain the animals and to provide information to show their ability to provide humane transport, facilities and care for the animals. An insignificant number of individuals may be deterred from participating by the fee or qualification standards for humane care.

Information collection requirements for Applications for Adoption of Wild Horse(s) or Burro(s) and for Applications for Title to Wild Horse(s) and Burro(s) have been approved by the Office of Management and Budget and assigned clearance numbers 1004-0042 and 1004-0046, respectively. Additional information collection requirements contained in this proposed rulemaking, relating to requests for removal of strayed animals from private land (§ 4720.2-1), and applications for private maintenance of 4 or more wild horses or burros (§ 4750.3-3), have been submitted to the Office of Management and Budget for review.

#### List of Subjects in 43 CFR Part 4700

Advisory committees, Aircraft, Intergovernmental relations, Penalties, Public lands, Range management, Wild horses and burros, Wildlife.

Under the provisions of the Act of September 8, 1959 (18 U.S.C. 47), the Act of December 15, 1971, as amended (16 U.S.C. 1331-1340), the Federal Land Policy and Management Act of 1976 (43 U.S.C. 1701 et seq.) and the Act of June 28, 1934, as amended (43 U.S.C. 315), it is proposed to amend Part 4700, Subchapter D, Chapter II, Title 43 of the Code of Federal Regulations as set forth below:

#### GROUP 4700—WILD FREE-ROAMING HORSE AND BURRO MANAGEMENT

#### PART 4700—PROTECTION, MANAGEMENT, AND CONTROL OF WILD FREE-ROAMING HORSES AND BURROS

##### Subpart 4700—General

- Sec.
- 4700.0-1 Purpose.
- 4700.0-2 Objectives.
- 4700.0-3 Authority.
- 4700.0-5 Definitions.
- 4700.0-6 Policy.

##### Subpart 4710—Management Considerations

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- 4710.2 Inventory and monitoring.
- 4710.3 Management areas.
- 4710.3-1 Herd management areas.
- 4710.3-2 Wild horse and burro ranges.
- 4710.4 Constraints on management.
- 4710.5 Closure to livestock grazing.
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##### Subpart 4720—Removal

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- 4720.2-1 Removal of strayed animals from private lands.
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##### Subpart 4730—Destruction of Wild Horses or Burros and Disposal of Carcasses

- 4730.1 Destruction.
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##### Subpart 4740—Motor Vehicle and Aircraft

- 4740.1 Use of motor vehicles or aircraft.
- 4740.2 Standards for vehicles used for transport of wild horses and burros.

##### Subpart 4750—Private Maintenance

- 4750.1 Private maintenance.
- 4750.2 Health, identification, and inspection requirements.
- 4750.2-1 Health and identification requirements.
- 4750.2-2 Brand inspection.
- 4750.3 Application requirements for private maintenance.
- 4750.3-1 Application for private maintenance of wild horses and burros.
- 4750.3-2 Qualification standards for private maintenance.
- 4750.3-3 Supporting information and certification for private maintenance of more than 4 wild horses or burros.
- 4750.3-4 Approval or disapproval of applications.
- 4750.4 Private maintenance of wild horses and burros.

## Sec.

- 4750.4-1 Private maintenance and care agreement.
- 4750.4-2 Adoption fee.
- 4750.4-3 Request to terminate private maintenance and care agreement.
- 4750.4-4 Replacement animals.
- 4750.5 Application for title to wild horses and burros.

**Subpart 4760—Compliance**

- 4760.1 Compliance with the Private Maintenance and Care Agreement.

**Subpart 4770—Prohibited Acts, Administrative Remedies, and Penalties**

- 4770.1 Prohibited acts.
- 4770.2 Civil penalties.
- 4770.3 Administrative remedies.
- 4770.4 Arrest.
- 4770.5 Criminal penalties.

**Authority:** Act of Dec. 15, 1971, as amended (16 U.S.C. 1331-1340). Act of Oct. 21, 1976 (43 U.S.C. 1701 et seq.). Act of Sept. 8, 1959 (18 U.S.C. 47). Act of June 28, 1934 (43 U.S.C. 315).

**§ 4700.0-1 Purpose.**

The purpose of these regulations is to implement the laws relating to the protection, management, and control of wild horses and burros under the administration of the Bureau of Land Management.

**§ 4700.0-2 Objectives.**

The objectives of these regulations are management of wild horses and burros as recognized components of the public lands under the principle of multiple use; protection of wild horses and burros from unauthorized capture, branding, harassment or death; and humane care and treatment of wild horses and burros.

**§ 4700.0-3 Authority.**

The Act of September 8, 1959 (18 U.S.C. 47); the Act of December 15, 1971, as amended (16 U.S.C. 1331-1340); the Federal Land Policy and Management Act of 1976 (43 U.S.C. 1711, 1712, and 1734); the Act of June 28, 1934, as amended (43 U.S.C. 315); and the National Environmental Policy Act of 1969 (42 U.S.C. 4321, 4331-4335, and 4341-4347).

**§ 4700.0-5 Definitions.**

As used in this part, the term:

(a) "Act" means the Act of December 15, 1971, as amended (16 U.S.C. 1331-1340), commonly referred to as the Wild Free-Roaming Horse and Burro Act.

(b) "Appropriate management level" means the median number of wild horses or burros 2 years old or older to be maintained on a herd management area.

(c) "Authorized officer" means any employee of the Bureau of Land Management to whom has been delegated the authority to perform the duties described herein.

(d) "Band" means either a group of

wild horses or burros running together, or a lone wild horse or burro.

(e) "Commercial exploitation" means using a wild horse or burro because of its characteristics of wildness for direct or indirect financial gain.

Characteristics of wildness include the rebellious and feisty nature of such animals and their defiance of man as exhibited in their undomesticated and untamed state. Use as saddle or pack stock and other uses that require domestication of the animal are not commercial exploitation of the animals because of their characteristics of wildness.

(f) "Excess wild horses or burros" means wild horses or burros (1) which have been removed from an area by the unauthorized officer pursuant to applicable law, or (2) which must be removed from an area in order to attain the appropriate management level.

(g) "Herd" means one or more bands using the same general area.

(h) "Humane treatment" means kind and merciful handling compatible with standard animal husbandry practices, without causing unnecessary stress or suffering to a wild horse or burro.

(i) "Inhumane treatment" means any intentional action or failure to act that causes stress, injury, or death to a wild horse or burro and is not compatible with standard animal husbandry practices.

(j) "Lame wild horse or burro" means a wild horse or burro with malfunctioning limbs that permanently impair its freedom of movement.

(k) "Old wild horse or burro" means a wild horse or burro characterized because of age by its physical deterioration, inability to fend for itself, suffering, or closeness to death.

(l) "Private maintenance" means the provision of proper care and humane treatment to excess wild horses and burros by qualified individuals under the terms and conditions specified in a Private Maintenance and Care Agreement.

(m) "Public lands" means any lands or interests in lands administered by the Secretary of the Interior through the Bureau of Land Management.

(n) "Sick wild horse or burro" means a wild horse or burro with failing health, infirmity or disease from which there is little chance of recovery.

(o) "Wild horses and burros" means all unbranded and unclaimed horses and burros that use public lands as all or part of their habitat, or that have been removed from these lands by the authorized officer but have not lost their status under section 3 of the Act.

**§ 4700.0-6 Policy.**

(a) Wild horses and burros and their

habitat shall be managed to maintain vigorous populations of healthy animals in balance with the productive capacity of the public lands.

(b) Wild horses and burros shall be considered comparably with other resource values in the formulation of land use plans.

(c) Management activities affecting wild horses and burros shall be undertaken with the goal of maintaining free-roaming behavior.

(d) In administering these regulations, the authorized officer shall consult with Federal and State wildlife agencies and all other affected interests, to involve them in planning for and management of wild horses and burros on the public lands.

(e) Healthy excess wild horses and burros for which an adoption demand by qualified individuals exists shall be made available at adoption centers nationwide for private maintenance and care.

(f) Fees shall be required from qualified individuals adopting excess wild horses and burros to defray part of the costs of the adoption program.

**Subpart 4710—Management Considerations****§ 4710.1 Land use planning.**

Management activities affecting wild horses and burros, including the establishment of herd management areas, shall be compatible with approved land use plans prepared pursuant to Part 1600 of this title.

**§ 4710.2 Inventory and monitoring.**

The authorized officer shall maintain a record of the herd areas that existed in 1971, and a current inventory of the numbers of animals and their areas of use. When management areas are established, the authorized officer shall also inventory and monitor herd and habitat characteristics, including, but not limited to, habitat condition and trend, the age, sex and social structure of bands and herds, and the condition and physical characteristics of the animals.

**§ 4710.3 Management areas.****§ 4710.3-1 Herd management areas.**

The authorized officer shall establish herd management areas for the maintenance and management of wild horse and burro herds. In delineating each herd management area, the authorized officer shall consider the appropriate management level for the herd, the habitat requirements of the animals, and the relationships with other uses of the public lands. The authorized officer shall prepare a herd

management area plan, which may cover one or more herd management areas.

**§ 4710.3-2 Wild horse and burro ranges.**

Herd management areas may also be designated by the authorized officer as wild horse or burro ranges to be managed principally, but not necessarily exclusively, for wild horse or burro herds.

**§ 4710.4 Constraints on management.**

Management of wild horses and burros shall be confined to areas used by herds as yearlong habitat in 1971. Management of wild horses and burros shall be at the minimum level necessary to obtain the objectives identified in approved land use plans and herd management area plans.

**§ 4710.5 Closure to livestock grazing.**

(a) If necessary to provide habitat for wild horses or burros, to implement herd management actions, or to protect wild horses or burros from disease, harassment or injury, the authorized officer may close appropriate areas of the public lands to grazing use by all or a particular kind of livestock.

(b) All public lands inhabited by wild horses or burros shall be closed to grazing by domestic horses and burros.

(c) Notices of closure and decisions requiring modification of authorized grazing use shall be issued as final decisions in full force and effect on the date specified in the notice or decision, regardless of appeal.

**§ 4710.6 Removal of unauthorized livestock in or near areas occupied by wild horses or burros.**

The authorized officer may establish conditions for the removal of unauthorized livestock in areas adjacent to or within areas occupied by wild horses or burros to prevent undue harassment of the wild horses or burros. Liability and compensation for damages from unauthorized use shall be determined in accordance with subpart 4150 of this title.

**§ 4710.7 Maintenance of wild horses and burros on unfenced privately controlled lands.**

Individuals controlling unfenced lands within areas occupied by wild horses and burros may allow wild horses or burros to use these lands. Individuals who maintain wild free-roaming horses and burros on their lands shall notify the authorized officer and shall supply a reasonable estimate of the number of such animals so maintained. Individuals shall not remove or entice wild horses or burros from the public lands or detain them on private lands.

**Subpart 4720—Removal**

**§ 4720.1 Removal of excess animals from public lands.**

Upon examination of current information and a determination by the authorized officer that an excess of wild horses or burros exists, the authorized officer shall remove the excess animals immediately in the following order:

(a) Old, sick, or lame animals shall be destroyed in accordance with Subpart 4730 of this title;

(b) Additional excess animals for which an adoption demand by qualified individuals exists shall be captured and made available for private maintenance in accordance with Subpart 4750 of this title; and

(c) Remaining excess animals for which no adoption demand by qualified individuals exists shall be destroyed in accordance with Subpart 4730 of this title.

**§ 4720.2 Removal of strayed or excess animals from private lands.**

**§ 4720.2-1 Removal of strayed animals from private lands.**

Upon written request from the private landowner to any representative of the Bureau of Land Management, the authorized officer shall remove stray wild horses and burros from private lands as soon as practicable. The private landowner may also submit the written request to a Federal marshal, who shall notify the authorized officer. The request should indicate the numbers of wild horses or burros, the date(s) the animals were on the land, legal description of the private land, and any special conditions that should be considered in the gathering plan.

**§ 4720.2-2 Removal of excess animals from private lands.**

If the authorized officer determines that proper management requires the removal of wild horses and burros from private lands, the authorized officer shall obtain the written consent of the private owner before entering or using such lands.

**Subpart 4730—Destruction of Wild Horses or Burros and Disposal of Carcasses**

**§ 4730.1 Destruction.**

Except as an act of mercy, no wild horse or burro shall be destroyed without the authorization of the authorized officer. Wild horses and burros shall be destroyed in the most humane and cost efficient manner possible.

**§ 4730.2 Disposal of carcasses.**

Carcasses of wild horses or burros shall be disposed of in accordance with State or local sanitation laws. No compensation of any kind shall be received by any agency or individual disposing of a carcass.

**Subpart 4740—Motor Vehicles and Aircraft**

**§ 4740.1 Use of motor vehicles or aircraft.**

(a) Motor vehicles and aircraft may be used by the authorized officer in all phases of the administration of the Act, except that no motor vehicle or aircraft, other than helicopters, shall be used for the purpose of herding or chasing wild horses or burros for capture or destruction.

(b) Before using helicopters in the capture of wild horses or burros or motor vehicles for their transport to adoption processing facilities, the authorized officer shall conduct a public hearing in the State where wild horses or burros are to be gathered.

**§ 4740.2 Standards for vehicles used for transport of wild horses and burros.**

(a) Use of motor vehicles for transport of wild horses or burros shall be in accordance with appropriate local, State and Federal laws and regulations applicable to the humane transportation of horses and burros, and shall include, but not be limited to, the following standards:

(1) The interior of enclosures shall be free from protrusions that could injure animals;

(2) Equipment shall be in safe conditions and of sufficient strength to withstand the rigors of transportation.

(3) Enclosures shall have ample head room to allow animals to stand normally;

(4) Enclosures for transporting two or more animals shall have partitions to separate them by age and sex as deemed necessary by the authorized officer;

(5) Floors of enclosures shall be covered with nonskid material;

(6) Enclosures shall be adequately ventilated and offer sufficient protection to animals from inclement weather and temperature extremes; and

(7) Unless otherwise approved by the authorized officer, transportation shall be limited in sequence to a maximum of 24 hours followed by a minimum of 5 hours of on-the-ground rest with adequate feed and water.

(b) The authorized officer shall not load wild horses or burros if he/she determines that the vehicle to be used for transporting the wild horses or

burros is not satisfactory for that purpose.

#### **Subpart 4750—Private Maintenance**

##### **§ 4750.1 Private maintenance.**

The authorized officer shall make available for private maintenance all healthy excess wild horses or burros for which an adoption demand by qualified individuals exists.

##### **§ 4750.2 Health, identification, and inspection requirements.**

##### **§ 4750.2-1 Health and identification requirements.**

(a) An individual determined to be qualified by the authorized officer shall verify each excess animal's soundness and good health, determine its age and sex, and administer tests for communicable diseases, immunizations and worming compounds.

(b) Documentation conforming compliance with State health inspection and immunization requirements for each wild horse or burro shall be provided to each adopter by the authorized officer.

(c) Each animal offered for private maintenance, including orphan and unweaned foals, shall be individually identified by the authorized officer with a permanent freeze mark of alpha numeric symbols on the left side of its neck. The freeze mark identifies the animal as Federal property subject to the provisions of the Act and these regulations by a patented symbol, the animal's year of birth, and its individual identification number. The authorized officer shall record the freeze mark on the documentation of health and immunizations. For purposes of this subpart, a freeze mark applied by the authorized officer is not considered a brand.

##### **§ 4750.2-2 Brand inspection.**

The authorized officer shall make arrangements on behalf of an adopter for State inspection of brands, where applicable, for each animal to be transported across the State where the adoption center is located only. The adopter shall be responsible for obtaining inspections for brands required by other States to or through which the animal may be transported.

##### **§ 4750.3 Application requirements for private maintenance.**

##### **§ 4750.3-1 Application for private maintenance of wild horses and burros.**

An individual applying for a wild horse or burro shall file an application with the Bureau of Land Management on a form approved by the Director. The application shall be accompanied by a nonrefundable guaranteed remittance of

\$25 (cashier's check, money order, bank draft, or any other form of remittance other than personal, company or payroll checks). If the application is approved by the authorized officer, the remittance shall be applied against the adoption fee required by § 4750.4-2 of this subpart.

##### **§ 4750.3-2 Qualification standards for private maintenance.**

(a) To qualify to receive a wild horse or burro for private maintenance, an individual shall:

(1) Be of legal age for entering contracts as determined by the law of the State or United States trust territory where the individual is a resident;

(2) Have no prior conviction for inhumane treatment of animals or for violation of the Act or these regulations;

(3) Have adequate feed, water, shelter, space, and transport equipment to provide humane care and treatment to the number of animals requested; and

(4) Have obtained no more than 4 wild horses and burros within the preceding 12-month period, unless specifically authorized in writing by the authorized officer.

(b) The authorized officer shall determine an individual's qualifications based upon information provided in the application form required by § 4750.3-1 of this subpart and Bureau of Land Management records of any previous private maintenance by the individual under the Act.

##### **§ 4750.3-3 Supporting information and certification for private maintenance of more than 4 wild horses or burros.**

(a) An individual applying for more than 4 wild horses or burros within a 12-month period, or an individual or group of individuals requesting to maintain more than 4 wild horses or burros at a single location, shall provide written certification that the applicant's facilities and capabilities appear adequate to maintain and care for the number of animals requested. This certification shall be obtained from a veterinarian, local humane official, cooperative extension agent or similarly qualified person approved by the authorized officer.

(1) The certification shall assert that the facilities satisfy Bureau of Land Management requirements, shall contain a description of the facilities, including corral size, pasture size and shelter, barn or stall dimensions, and shall note discrepancies between the facilities inspected and representations made in the application form.

(2) When an applicant requests 25 or more animals or when more than 24 animals will be maintained at any single location regardless of the number of

applicants, the facilities for maintaining the adopted animals shall be inspected by the authorized officer.

(b) Any individual or group requesting to maintain more than 4 wild horses or burros at a single location shall also provide the following information:

(1) A summary of the age, sex, and number of wild free-roaming horses or burrow requested by species;

(2) Requested adoption date and center location;

(3) If applicable, names, addresses and telephone numbers of all applicants represented by any power of attorney submitted with the request;

(4) A transportation plan that describes the transport vehicle and any rest-stops;

(5) A distribution plan for delivering the animals to their assigned adopters;

(6) Names, addresses, and a concise background of the experience of the individuals who will handle the adopted animals during transportation and distribution; and

(7) When the adopted animals will be maintained at a single location or where the applicants have been solicited by the holder of their power of attorney, a concise statement outlining the arrangements, including duties and responsibilities of the parties, for maintaining the animals.

##### **§ 4750.3-4 Approval or disapproval of applications.**

If an application is approved, the authorized officer shall offer the individual an opportunity to select the appropriate number, sex, age and species of animals from those available. If the authorized officer disapproves an application for private maintenance because the applicant lacks adequate facilities or transport, the individual may correct the shortcoming and file a new application.

##### **§ 4750.4 Private maintenance of wild horses and burros.**

##### **§ 4750.4-1 Private Maintenance and Care Agreement.**

To obtain a wild horse or burro, a qualified applicant shall execute a Private Maintenance and Care Agreement and agree to abide by its terms and conditions, including but not limited to the following:

(a) Title to wild horses and burros covered by the agreement shall remain in the Federal Government for at least 1 year after the Private Maintenance and Care Agreement is executed and until a Certificate of Title is issued by the authorized officer;

(b) Wild horses and burros covered by the agreement shall not be destroyed,

except as an act of mercy, without the prior approval of the authorized officer;

(c) Wild horses and burros covered by the agreement shall not be sold or otherwise exploited commercially, neglected, abandoned, inhumanely treated, branded or otherwise marked permanently, or used for bucking stock;

(d) Freeze marks identifying wild horses and burros covered by the agreement shall not be altered or destroyed;

(e) Wild horses and burros covered by the agreement shall not be transferred permanently to another location or to the care of another individual without the prior approval of the authorized officer;

(f) Wild horses and burros covered by the agreement shall be made available for physical inspection upon written request by the authorized officer;

(g) The authorized officer shall be notified within 7 days of discovery of the death, theft or escape of wild horses and burros covered by the agreement; and

(h) Maintaining and properly caring for wild horses and burros covered by the agreement shall be the responsibility of the adopter.

#### § 4750.4-2 Adoption fee.

(a) An individual obtaining wild horses and burros shall pay the Bureau of Land Management an adoption fee of \$125 per horse and \$75 per burro, except that no fee shall be paid for an orphan foal under the age of 6 months or an unweaned foal under the age of 6 months accompanying its mother. The authorized officer shall credit the advance payment required by § 4750.3-1 of this subpart to the total adoption fee and collect the remaining adoption fee from the individual when the Private Maintenance and Care Agreement is executed.

(b) The Director may adjust or waive the adoption fee on determining that wild horses or burros in the custody of the Bureau of Land Management are unadoptable when the full adoption fee is required, and that it is in the public interest to adjust or waive the adoption fee stated in paragraph (a) of this section. The adjustment or waiver shall extend only to those persons who are willing to maintain such animals privately, who demonstrate the ability to care for them properly, and who agree to comply with all rules and regulations relating to wild horses and burros.

#### § 4750.4-3 Request to terminate Private Maintenance and Care Agreement.

An adopter may request to terminate his/her responsibility for an animal by submitting a written relinquishment of

the Private Maintenance and Care Agreement for that animal. The authorized officer shall take possession of the animal upon receipt of the written relinquishment.

#### § 4750.4-4 Replacement animals.

The authorized officer shall replace an animal, upon request by the adopter, if (a) within 60 days of the execution of the Private Maintenance and Care Agreement the animal dies or is required to be destroyed due to a condition that existed at the time of placement with the adopter; and (b) the adopter provides, within a reasonable time, a statement by a veterinarian certifying that reasonable care and treatment would not have corrected the condition. Transportation costs of the replacement animal shall be paid by the adopter.

#### § 4750.5 Application for title to wild horses and burros.

(a) An adopter who has abided by the terms and conditions of the Private Maintenance and Care Agreement for 12 months may apply for title to the wild horse(s) and burro(s) covered by the agreement. A qualified adopter may be granted title to no more than 4 animals per 12-month period of proper private maintenance. This credit may be accumulated from year to year if not used.

(b) An adopter applying for title shall file an application with the Bureau of Land Management. The adopter shall submit with the application a statement from a veterinarian, cooperative extension agent, local humane official, or similarly qualified individual approved by the authorized officer certifying that he/she has inspected the animal for which title is requested and that the animal is receiving proper care and treatment. The adopter shall certify that he/she has provided care and treatment in accordance with the Private Maintenance and Care Agreement.

(c) If the application for title is approved, the authorized officer shall issue a Certificate of Title for each animal. Effective the date of issuance of the Certificate of Title, Federal ownership of the wild horse or burro ceases and the animal loses its status as a wild horse or burro and is no longer under the protection of the Act or regulations under this title.

#### Subpart 4760—Compliance

##### § 4760.1 Compliance with the Private Maintenance and Care Agreement.

(a) An adopter shall comply with the terms and conditions of the Private Maintenance and Care Agreement and these regulations. The authorized officer may verify compliance by visits to an

adopter, physical inspections of the animals, and inspections of the facilities and conditions in which the animals are being maintained. The authorized officer may authorize a cooperative extension agent, local humane official or similarly qualified individual to verify compliance.

(b) The authorized officer shall conduct an investigation when a complaint concerning the care, treatment, or use of a wild horse or burro is received by the Bureau of Land Management.

(c) The authorized officer may require, as a condition for continuation of a Private Maintenance and Care Agreement, that an adopter take specific corrective actions if the authorized officer determines that an animal is not receiving proper care or is being maintained in unsatisfactory conditions. The adopter shall be given reasonable time to complete the required corrective actions.

#### Subpart 4470—Prohibited Acts, Administrative Remedies, and Penalties

##### § 4770.1 Prohibited acts.

The following acts are prohibited:

(a) Maliciously injuring or harassing a wild horse or burro;

(b) Removing or attempting to remove a wild horse or burro from the public lands without authorization from the authorized officer;

(c) Destroying a wild horse or burro without authorization from the authorized officer except as an act of mercy;

(d) Selling or attempting to sell, directly or indirectly, a wild horse or burro;

(e) Commercially exploiting a wild horse or burro;

(f) Treating a wild horse or burro inhumanely;

(g) Using a wild horse or burro for bucking stock;

(h) Violating a term or condition of the Private Maintenance and Care Agreement;

(i) Applying a brand;

(j) Removing or altering a freeze mark.

##### § 4770.2 Civil penalties.

(a) A grazing permittee or lessee who has been convicted or otherwise found in violation of any of these regulations may be subject to suspension or cancellation of the grazing permit or lease and of the grazing preference, as provide in § 4170.1-1 of this title.

(b) An adopter's failure to comply with the terms and conditions of the Private Maintenance and Care

Agreement may result in the cancellation of the agreement, repossession of wild horses and burros included in the agreement, and disapproval of requests by the adopter for additional excess wild horses and burros.

**§ 4770.3 Administrative remedies.**

Any person who is adversely affected by a decision of the authorized officer in the administration of these regulations may file an appeal in accordance with 43 CFR 4.4 within 30 days of receipt of the written decision.

**§ 4770.4 Arrest.**

The Director of the Bureau of Land Management may authorize an

employee who witnesses a violation of the Act or these regulations to arrest without warrant any person committing the violation, and to take the person immediately for examination or trial before an officer or court of competent jurisdiction. Any employee so authorized shall have power to execute any warrant or other process issued by an officer or court of competent jurisdiction to enforce the provisions of the Act of these regulations.

**§ 4770.5 Criminal penalties.**

Any person who commits any act prohibited in section 4770.1 of these regulations shall be subject to a fine of not more than \$2,000 or imprisonment for not more than 1 year, or both, for

each violation. Any person so charged with such violation by the authorized officer may be tried and sentenced by a United States Commissioner or magistrate, designated for that purpose by the court by which he/she was appointed, in the same manner and subject to the same conditions as provided in 18 U.S.C. 3401.

Garrey E. Carruthers,  
*Assistant Secretary of the Interior.*

August 15, 1984.

[FR Doc. 32834 Filed 12-17-84; 8:45 am]

BILLING CODE 4310-84-M

## **Exhibit B**

Copy of 43 C.F.R. §4700 et seq. (1985)

**Bureau of Land Management, Interior****Part 4700**

allowed to remove all personal property belonging to him, together with any fence, building, corral, or other removable range improvements owned by him. All such property which is not removed within the time allowed shall thereupon become the property of the United States.

**Subpart 4330—Protests****§ 4330.1 Protests.**

Protests against an application for a grazing permit shall be filed in duplicate, with the authorized officer; contain a complete disclosure of all facts upon which the protest is based; and describe the lands involved in such protests. It shall be accompanied by evidence of service of a copy of the protest upon the applicant. If the protestant desires to obtain a grazing permit for all or part of the land embraced in the application against which the protest is filed, the protest shall be accompanied by an application for a grazing permit.

**Subpart 4340—Trespass****§ 4340.1 Trespass.**

(a) Any use of the Federal lands for reindeer grazing purposes, unless authorized by a valid permit issued in accordance with the regulations in this part is unlawful and is prohibited.

(b) Any person who willfully violates any of the rules and regulations in this part shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be punishable by imprisonment for not more than 1 year, or by a fine of not more than \$500.

**Group 4700—Wild Free-Roaming Horse and Burro Management**

**NOTE:** The information collection requirements contained in Subpart 4740 of Group 4700 have been approved by the Office of Management and Budget under 44 U.S.C. 3507 and assigned clearance numbers 1004-0042 and 1004-0046. The information is being collected to permit the authorized officer to determine whether an application for adoption of or title of to wild horses or burros should be granted. The information will be used to make this determination. A response is required to obtain a benefit.

[48 FR 40890, Sept. 12, 1983]

**PART 4700—WILD FREE-ROAMING HORSE AND BURRO PROTECTION, MANAGEMENT, AND CONTROL****Subpart 4700—Purpose; Objectives; Authority; Definitions; Policy****Sec.**

- 4700.0-1 Purpose.
- 4700.0-2 Objectives.
- 4700.0-3 Authority.
- 4700.0-5 Definitions.
- 4700.0-6 Policy.

**Subpart 4710—Coordination**

- 4710.1 Joint National Advisory Board.
- 4710.2 State agencies.
- 4710.3 Cooperative agreements.
- 4710.4 Research.

**Subpart 4720—Removal of Claimed Trespass Horses and Burros**

- 4720.1 Unauthorized and unbranded animals.
- 4720.2 Claimed animals.
- 4720.3 Trespass animals.

**Subpart 4730—Management Considerations**

- 4730.1 Inventory and planning.
- 4730.2 Intensity of management.
- 4730.3 Habitat reservation and allocation.
- 4730.4 Closure to livestock grazing.
- 4730.5 Designation of specific ranges.
- 4730.6 Herd management plan.
- 4730.7 Aircraft and motor vehicles.
- 4730.7-1 Fixed-wing aircraft.
- 4730.7-2 Helicopters.
- 4730.7-3 Motor vehicles.

**Subpart 4740—Removal and Relocation of Excess or Problem Animals**

- 4740.1 Capture.
- 4740.2 Humane use of helicopters and motor vehicles.
- 4740.3 Removal.
- 4740.3-1 Acts of mercy.
- 4740.3-2 Loss of status.
- 4740.3-3 Disposal of carcasses.
- 4740.4 Relocation.
- 4740.4-1 Relocation on public lands.
- 4740.4-2 Applications.
- 4740.4-3 Custodial arrangements.
- 4740.5 Granting of title.

**Subpart 4750—Management on Private Lands**

- 4750.1 Criteria for animals on private lands.
- 4750.2 Maintenance.
- 4750.3 Removal.

## § 4700.0-1

## 43 CFR Ch II (10-1-85 Edition)

Sec.

**Subpart 4760—Enforcement Provisions**

4760.1 Arrest.

4760.2 Penalties.

**AUTHORITY:** Act of Dec. 15, 1971 (16 U.S.C. 1331-1340), Act of June 28, 1934 (43 U.S.C. 315-315r), unless otherwise noted.

**SOURCE:** 41 FR 9879, Mar. 8, 1976, unless otherwise noted.

**Subpart 4700—Purpose; Objectives; Authority; Definitions; Policy**

## § 4700.0-1 Purpose.

To implement the laws relating to wild free-roaming horses and burros on public lands.

## § 4700.0-2 Objectives.

The objective of these regulations is to provide criteria and procedures for protecting, managing, and controlling wild free-roaming horses and burros as a recognized component of the public land environment.

## § 4700.0-3 Authority.

The Act of December 15, 1971 (16 U.S.C. 1331-1340), as amended, and the Act of June 28, 1934 (43 U.S.C. 315 through 315r).

[42 FR 26654, May 25, 1977]

## § 4700.0-5 Definitions.

(a) "Authorized officer" means any employee of the Bureau of Land Management to whom has been delegated the authority to perform the duties described herein.

(b) "Wild free-roaming horses and burros" means all unbranded and unclaimed horses and burros and their progeny that have used public lands on or after December 15, 1971, or that do use these lands as all or part of their habitat, including those animals given an identifying mark upon capture for live disposal by the authorized officer. Unbranded, claimed horses and burros where the claim is found to be erroneous are also considered as wild and free-roaming if they meet the criteria above. However, this definition shall not include any horse or burro which entered or was introduced onto public lands after December 15, 1971,

by accident, negligence, or willful disregard of ownership.

(c) "Herd" means one or more stallions and their mares or jacks and their jennies.

(d) "Excess animals" means wild free-roaming horses or burros (1) which have been removed from an area by the authorized officer pursuant to applicable law or, (2) which must be removed from an area in order to preserve and maintain a thriving natural ecological balance and multiple-use relationship in that area.

(e) "Problem animal" means a wild free-roaming horse or burro whose demonstrated individual habits or traits pose an undue threat to the safety or welfare of persons, wildlife, livestock, or property; or a wild free-roaming horse or burro infected by a contagious disease or suspected of being diseased or seriously ill.

(f) "Public lands" means any lands administered by the Secretary of the Interior through the Bureau of Land Management.

(g) "Wild horse or burro range" means a specifically designated area of land needed to sustain a herd or herds of wild free-roaming horses or burros, and which is devoted principally but not necessarily exclusively to their welfare in keeping with the multiple use management of the public lands.

(h) "Management plan" means a written program of action designed to protect, manage, and control wild free-roaming horses and burros and maintain a natural ecological balance on the public lands.

(i) "Act" means the Act of December 15, 1971 (16 U.S.C. 1331 through 1340); as amended.

(j) "Advisory Board" means the joint advisory board established by the Secretary of the Interior and the Secretary of Agriculture pursuant to section 7 of the Act.

(k) "Malicious harassment" means any intentional act which demonstrates a deliberate disregard for the well-being of wild free-roaming horses and burros and which creates the likelihood of injury, or is detrimental to normal behavior patterns of wild free-roaming horses and burros including feeding, watering, resting, and breeding. Such acts include, but are not lim-

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ited to, unauthorized chasing, pursuing, herding, roping, or attempting to gather or catch wild free-roaming horses and burros. It does not apply to lawfully conducted activities by or on behalf of the Bureau of Land Management or the Forest Service in implementation or performance of duties and responsibilities under this Act.

(l) "Captured animal" means a wild free-roaming horse or burro taken and held in the custody of the authorized officer. This term does not apply to an animal placed in private custody through a cooperative agreement under § 4740.2(b) or § 4750.2.

(m) "Humane procedure" means kind and merciful treatment, without causing unnecessary stress or suffering to the animal.

(n) "Commercial exploitation" means using a wild free-roaming horse or burro, because of its characteristics of wildness, for direct or indirect financial gain. Characteristics of wildness include the rebellious and feisty nature of such animals and their defiance of man as exhibited in their undomesticated and untamed state. Uses such as saddle or pack stock or other uses that require domestication of the animal are not commercial exploitation of the animals because of their characteristics of wildness.

(o) "Inhumane treatment" means causing physical stress to an animal through any harmful action or omission that is not compatible with standard animal husbandry practices; causing or allowing an animal to suffer from a lack of necessary food, water or shelter; using any equipment, apparatus, or technique during transportation, domestication or handling that causes undue injury to an animal; or failing to treat or care for a sick or injured animal.

(p) "Old" means a wild free-roaming horse or burro characterized by its inability to fend for itself because of age, physical deterioration, suffering or closeness to death.

(q) "Sick" means a wild free-roaming horse or burro with failing health, infirmness or disease from which there is little chance of recovery.

(r) "Lame" means a wild free-roaming horse or burro with malfunction-

ing muscles, ligaments or limbs that impair its freedom of movement.

[41 FR 9879, Mar. 8, 1976, as amended at 42 FR 26654, May 25, 1977; 44 FR 76985, Dec. 28, 1979]

**§ 4700.0-6 Policy.**

(a) Wild free-roaming horses and burros are under the jurisdiction of the Secretary of the Interior and will be managed as an integral part of the natural systems of the public lands. They will be protected from unauthorized capture, branding, undue disturbance, and destruction. They and their habitat will be managed and controlled in a manner designed to achieve and maintain a thriving ecological balance on the public lands and a thriving population of sound, healthy individuals, all in accordance with the basic program policies for public land management set forth in Subpart 1725 of this chapter.

(b) Wild free-roaming horses and burros on the public lands will be managed by the authorized officer, with full public participation and such cooperative arrangements as he may find helpful. Management on public lands will not be assigned to any private individual or association through a grazing license, lease, or permit.

(c) Wild free-roaming horses and burros where found on public lands shall be considered comparably with other resource values in the development of resource management plans under the Bureau's planning system including allocation of appropriate portions of the available forage.

(d) Where wild free-roaming horses and burros use, as part of their habitat, public lands administered by the Bureau of Land Management and lands in the National Forest system, the Bureau of Land Management shall cooperate to the fullest extent with the Forest Service in the management of these animals.

[41 FR 9879, Mar. 8, 1976, as amended at 44 FR 76985, Dec. 28, 1979]

**§ 4710.1****43 CFR Ch II (10-1-85 Edition)****Subpart 4710—Coordination****§ 4710.1 Joint National Advisory Board.**

Policies and guidelines relative to proposals for establishment of ranges, proposed management plans, adjustments in number, relocation and disposal of animals, and other matters relating generally to the protection, management, and control of wild free-roaming horses and burros shall be presented to the Advisory Board for recommendations.

**§ 4710.2 State agencies.**

(a) All management activities including, but not limited to, establishment of ranges and adjustments in forage allocation shall be planned and executed in consultation with the appropriate State agency to further consider the needs of all wildlife, particularly endangered species.

(b) All actions taken in connection with private ownership claims to unbranded horses and burros shall be coordinated to the fullest extent possible with the appropriate State agency.

**§ 4710.3 Cooperative agreements.**

The authorized officer may enter into cooperative agreements with other landowners, private citizens, nonprofit organizations, and with Federal, State, and local governmental agencies as he deems necessary for purposes of protecting, managing and controlling wild free-roaming horses and burros. Where the grazing patterns of the animals require utilization of lands in other ownerships or administration, the authorized officer shall seek cooperative agreements to insure continuance of such use.

**§ 4710.4 Research.**

Research activities in the management of wild free-roaming horses and burros shall be conducted pursuant to a contract entered into between authorized individuals or organizations and the authorized officer.

[41 FR 9879, Mar. 8, 1976, as amended at 45 FR 47842, July 17, 1980]

**Subpart 4720—Removal of Claimed Trespass Horses and Burros****§ 4720.1 Unauthorized and unbranded animals.**

(a) All unauthorized and unbranded horses and burros on the public lands, except those which entered or were introduced onto the public lands after December 15, 1971, by accident, negligence, or willful disregard of ownership are presumed for the purpose of management to be wild free-roaming horses or burros.

(b) The gathering or rounding up of unbranded horses or burros on the public lands where any of such animals are not in fact authorized to be on the public lands pursuant to a grazing license, permit, lease, or other authorization, is prohibited without written authorization from the authorized officer. Also prohibited without written authorization from the authorized officer is the gathering or rounding up of unauthorized branded horses or burros where the branded animals are, or may become, intermingled with wild free-roaming horses or burros, or where the gathering or roundup is likely to involve or affect wild free-roaming horses or burros.

**§ 4720.2 Claimed animals.**

(a) Any person claiming ownership under State branding and estray laws of unbranded or branded horses or burros on public land where such animals are not authorized must present evidence of ownership to justify a roundup before permission will be granted to gather such animals. Claims of ownership with supporting evidence were required to be filed during a 90-day claiming period which expired November 15, 1973. Unauthorized privately owned horses or burros entering onto the public lands after November 15, 1973, may be claimed by filing an application with the District Manager. All written authorizations to gather claimed animals shall be on a form approved by the Director and shall provide for compliance with appropriate provisions of Subpart 4720. After such public notice as the authorized officer deems appropriate to inform interested parties, he may au-

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thorize the gathering or roundup. The authorized officer shall provide in the authorization that the gathering or roundup shall be consistent with these regulations; shall establish in the authorization a reasonable period of time to allow the gathering of the claimed animals; and shall provide such other conditions in the authorization which he deems necessary to minimize stress on any associated wild free-roaming horses or burros and to protect other resources.

(b) Animals captured in Bureau of Land Management conducted roundups and determined to be privately owned may be secured by the appropriate claimant upon payment of trespass charges in accordance with § 4720.3, and a per head share of helicopter rental and other associated costs determined appropriate by the authorized officer.

[42 FR 26655, May 25, 1977]

**§ 4720.3 Trespass animals.**

Unauthorized horses or burros which have been claimed and have been determined to be privately owned in accordance with the provisions of this section will be considered to have been in trespass and may not be released until a proper trespass charge has been determined by the authorized officer in accordance with the provisions of Subpart 4150 of this subchapter.

[43 FR 29076, July 5, 1978]

**Subpart 4730—Management Considerations****§ 4730.1 Inventory and planning.**

(a) A current inventory of wild free-roaming horses and burros shall be maintained by the authorized officer for each area where a herd exists for the purpose of evaluating population dynamics including whether and where excess animals exist as a basis for making management decisions. Such inventory will be designed to estimate animal numbers, productivity, sex ratio and age structure for each herd.

(b) In planning for management, protection, and control of wild free-roaming horses and burros, including

determination of desirable numbers and other management requirements of these regulations, the authorized officer will utilize the Bureau's multiple-use planning system.

(c) Using the information developed from inventory data and planning the authorized officer shall determine:

(1) Appropriate protection and management for wild free-roaming horses and burros on the management areas under consideration; and

(2) The appropriate actions needed to achieve proper population levels.

(d) In making these determinations, the authorized officer shall consult with the U.S. Fish and Wildlife Service, State wildlife agencies, individuals independent of Federal or State government recommended by the National Academy of Sciences, and any other individuals who he determines have scientific expertise or special knowledge of wild horse and burro protection, wildlife management and animal husbandry as related to rangeland management.

[44 FR 76985, Dec. 28, 1979]

**§ 4730.2 Intensity of management.**

Wild free-roaming horse or burro herds may be managed either as one of the components of public land use or on a specifically designated wild horse or burro range. Management practices shall be at the minimal feasible level and shall be consistent to the extent possible and practical with the maintenance of their free-roaming behavior. Management facilities should be designed and constructed to the extent possible to maintain the free-roaming behavior of the herds.

**§ 4730.3 Habitat reservation and allocation.**

The biological requirements of wild free-roaming horses and burros will be determined based upon appropriate studies or other available information. The needs for soil and watershed protection, domestic livestock, maintenance of environmental quality, wildlife, and other factors will be considered along with wild free-roaming horse and burro requirements. After determining the optimum number of such horses and burros to be main-

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tained on an area, the authorized officer shall reserve adequate forage and satisfy other biological requirements of such horses and burros and, when necessary, adjust or exclude domestic livestock use accordingly. See §§ 4110.2-2 and 4110.3-2 of this subchapter.

[43 FR 29076, July 5, 1978]

**§ 4730.4 Closure to livestock grazing.**

The authorized officer may close public lands to use by all or a particular kind of domestic livestock where it is necessary to allocate all available forage to, or to satisfy other biological requirements of wild free-roaming horses or burros. Such closures may be made only after appropriate public notice and in accordance with the procedures for reduction or cancellation of grazing privileges provided for under provisions in this subchapter. See §§ 4110.2-2 and 4110.3-2 of this subchapter.

[43 FR 29076, July 5, 1978]

**§ 4730.5 Designation of specific ranges.**

The authorized officer may designate and maintain specifically designated ranges principally for the protection and preservation of wild free-roaming horses and burros. In designating specific ranges and herd management areas, the authorized officer, in addition to any other provisions of these regulations, shall:

(a) Consider only those areas utilized by wild free-roaming horses or burros as all or part of their habitat on December 15, 1971.

(b) Consider only those areas where self-sustaining herds can maintain themselves within their established utilization and migratory patterns.

(c) Consider only those areas which are capable of being managed as a unit to ensure a sustained yield of forage without jeopardy to the resources.

(d) Develop a wild free-roaming horse or burro management plan in accordance with § 4730.6.

**§ 4730.6 Herd management plan.**

The authorized officer shall, in connection with the designation of a specific range, develop a proposed wild free-roaming horse or burro manage-

ment plan designed to protect, manage, and control wild free-roaming horses and burros on the area on a continuing basis. The authorized officer may also develop herd management plans as part of the multiple use management on areas outside of specifically designated wild horse or burro ranges. All management plans shall be developed in accordance with the Bureau's planning system and shall govern management of the area.

**§ 4730.7 Aircraft and motor vehicles.****§ 4730.7-1 Fixed-wing aircraft.**

Fixed-wing aircraft may be used for inventory, observation, and surveillance purposes required for the administration of the Act. Such aircraft use shall be consistent with the Act of September 8, 1959, as amended (18 U.S.C. 41 et seq.). Fixed-wing aircraft shall not be used in connection with capture operations except as support vehicles.

[42 FR 26655, May 25, 1977]

**§ 4730.7-2 Helicopters.**

Only the authorized officer may use or contract for the use of helicopters in the administration of the Act. Helicopters may be used in all phases of the administration of the Act including, but not limited to, inventory, observation, surveillance, and capture operations (see § 4740.4). Helicopters may be used in areas where all animals are claimed, only if forage, habitat, or watershed resources are being adversely affected by horses and burros and helicopters are the only feasible method available to capture and remove the animals. The authorized officer shall supervise all helicopter use as follows:

(a) The authorized officer shall have the means to communicate with the pilot and be able to direct the use of the helicopter.

(b) The authorized officer shall be able to observe the effects of the use of the helicopter on the well-being of the animals.

(c) Notwithstanding any provision of this section, researchers who have entered into contracts with the Bureau of Land Management under the au-

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thority of the act may use helicopters in the performance of such research activities without the supervision of the authorized officer; *Provided that:* Helicopters permitted for research shall not:

(1) Be used to kill or remove from the public lands wild free-roaming horses or burros; or

(2) Create undue or needless stress in wild free-roaming horses or burros.

[42 FR 26655, May 25, 1977, as amended at 45 FR 47843, July 17, 1980]

**§ 4730.7-3 Motor vehicles.**

Motor vehicles may be used in the administration of the Act except that such vehicles shall not be used in connection with capture operations for driving or chasing the animals. The use of motor vehicles for the purpose of transporting captured animals is subject to the provisions of § 4740.4(b).

[42 FR 26655, May 25, 1977]

**Subpart 4740—Removal and Relocation of Excess or Problem Animals**

SOURCE: 44 FR 76985, Dec. 28, 1979, unless otherwise noted.

**§ 4740.1 Capture.**

Under the supervision of the authorized officer, where it has been determined necessary, wild free-roaming horses and burros may be captured, corralled and held in a humane manner. All excess or problem animals will be held under humane conditions pending disposal under the provisions of this subpart.

**§ 4740.2 Humane use of helicopters and motor vehicles.**

(a) The use of helicopters is authorized to locate the animals involved and for related purposes such as to transport personnel and equipment. The condition of the animals shall be continuously observed by the authorized officer and should signs of unnecessary stress be noted, the source of stress shall be removed so as to allow for recovery. Helicopters may be used in roundups or other capture operations subject to the following humane procedures:

(1) Helicopters shall be used in such a manner that bands or herds will tend to remain together.

(2) The rate of movement shall not exceed limitations set by the authorized officer who shall consider terrain, weather, distance to be traveled, and condition of animals.

(3) The helicopter shall be used to enable the authorized officer to look for the presence of dangerous areas and move the animals away from hazards during the capture operation.

(4) During capture operations, animals shall be moved in such a way as to prevent unnecessary stress or injury.

(b) Motor vehicles may be used for the purposes of transporting captured animals, subject to the following humane procedures:

(1) All such transportation shall be in compliance with appropriate State and Federal laws and regulations applicable to the humane transportation of horses and burros.

(2) Vehicles shall be in good repair, of adequate rated capacity, and carefully operated so as to insure that captured animals are transported without undue risk of injury.

(3) Vehicles shall be inspected and approved by an authorized officer prior to use.

(4) Where necessary and practical, animals shall be sorted as to age, size, temperament, sex, and condition when transporting them so as to minimize, to the extent possible, injury due to fighting and trampling.

(5) The authorized officer shall consider the condition of the animals, weather conditions, type of vehicles, and distance to be transported when planning for the movement of captured animals.

(c) The transportation of wild free-roaming horses and burros shall be under humane conditions. Unless otherwise approved by the authorized officer, transportation shall be limited, in sequence, to a maximum of 24 hours followed by a minimum of 5 hours of on-the-ground rest with adequate feed and water.

**§ 4740.3****43 CFR Ch II (10-1-85 Edition)****§ 4740.3 Removal.**

(a) The authorized officer, after making a determination that there are excess animals in an area shall immediately take action to remove those animals from the public lands. Such action shall be taken in the following order and priority, until all excess animals have been removed so as to restore a thriving natural ecological balance to the range, and protect the range from deterioration associated with overpopulation:

(1) Old, sick, or lame animals shall be destroyed in the most humane manner possible. If there are equally humane methods, the most cost efficient may be selected.

(2) Any additional excess animals shall be humanely captured and removed for maintenance and care for which the authorized officer determines an adoption demand exists by qualified persons, organizations, or agencies and for which he determines he can assure humane treatment and care (including proper transportation, feeding, and handling).

(3) Additional excess animals for which an adoption demand by qualified individuals does not exist shall be destroyed in the most humane manner possible. If there are equally humane methods, the most cost efficient may be selected.

(b) Where the authorized officer finds it necessary to remove excess animals from areas of the public lands, and he determines that it is not practical to relocate them on public lands or capture and remove them for maintenance, he may destroy such animals in the most humane manner possible. No person, except the authorized officer or his authorized representative, shall destroy wild free-roaming horses and burros.

(c) The authorized officer, after making a determination that there are problem animals in an area and that action is required, shall humanely remove the animals and may dispose of them in the same manner as excess animals including the relocation or return to the public lands.

**§ 4740.3-1 Acts of mercy.**

Any severely injured or seriously sick animals will be destroyed in the

most humane manner possible as an act of mercy.

**§ 4740.3-2 Loss of status.**

Wild free-roaming horses and burros or their remains shall lose their status as such:

(a) Upon passage of title under § 4740.5 of this part;

(b) If they have been transferred for private maintenance or adoption pursuant to this Act and die of natural causes before passage of title;

(c) Upon destruction by the authorized officer or his designee pursuant to section 3(b) of the Act;

(d) If they die of natural causes on the public lands or on private lands where maintained thereon pursuant to section 4 of the Act and disposal is authorized by the authorized officer or his designee; or

(e) Upon destruction or death for purposes of or incident to the program authorized in section 3 of the Act.

**§ 4740.3-3 Disposal of carcasses.**

Carcasses of animals that have lost their status as wild free-roaming horses and burros may be disposed of in any customary manner. However, no consideration of any kind shall be received by any person who transfers the remains of a wild free-roaming horse or burro, that has not lost its status as such, to a rendering plant or other facility for disposal.

**§ 4740.4 Relocation.**

Wild free-roaming horses and burros may be relocated when:

(1) The authorized officer determines there are excess animals in an area;

(2) They have been removed from private lands under § 4750.3 of this title;

(3) They are problem animals; or

(4) The authorized officer determines that proper resource and herd management requires such action.

**§ 4740.4-1 Relocation on public lands.**

(a) Wild free-roaming horses and burros shall not be introduced by relocation to areas of public land that were not being used by wild free-roam-

**Bureau of Land Management, Interior****§ 4740.4-3**

ing horses or burros as all or part of their habitat on December 15, 1971.

(b) Before wild free-roaming horses and burros are relocated to a different area of the public lands a written determination shall be made by the authorized officer that the action meets the requirements of the Bureau of Land Management's resource management plans and that the area has an adequate allocation of forage for the animals relocated.

**§ 4740.4-2 Applications.**

Any qualified person, organization or government agency wishing to take custody of a wild free-roaming horse or burro shall file an application with the Denver Service Center of the Bureau of Land Management. The application shall be filed on a form approved by the Director, Bureau of Land Management, and shall be accompanied by a nonrefundable advance payment of \$25 by guaranteed remittance. In order to maintain an application filed with the Bureau before the effective date of this section, the applicant shall submit an advance payment of \$25 by guaranteed remittance no later than 30 days after the effective date of this section. If custody of a wild free-roaming horse or burro is granted by the authorized officer, the advance payment shall be applied against the custodial fee required to be paid at the time the cooperative agreement required by § 4740.4-3 of this title is executed.

(Act of December 15, 1971, as amended (16 U.S.C. 1331-1340), the Act of June 26, 1934 (43 U.S.C. 315-315r) and the Federal Land Policy and Management Act of 1976 (43 U.S.C. 1701 *et seq.*))

[48 FR 9262, Mar. 4, 1983]

**§ 4740.4-3 Custodial arrangements.**

(a) The authorized officer may transfer for private maintenance or adoption up to 4 wild free-roaming horses or burros per year to any qualified person, organization, or government agency.

(b) Wild free-roaming horses and burros shall be transferred only to an applicant of a legal age in the State in which the applicant resides.

(c) Notwithstanding the provision of paragraph (a) of this section, more

than four animals per year may be transferred to any qualified person, organization, or agency for adoption if the authorized officer determines in writing that the applicant is capable of humanely transporting and caring for the additional animals.

(d) Before wild free-roaming horses or burros are transferred, the applicant shall:

(1) Pay a custodial fee of \$125 for each horse and \$75 for each burro, except there shall be no custodial fee for an unweaned offspring under 6 months of age accompanying its mother, plus any transportation costs incurred for the transportation of the animals to the point of pickup; and

(2) Sign a cooperative agreement that incorporates provisions for custodial maintenance, including, but not limited to, provisions for proper maintenance of the animals and protection from inhumane treatment and commercial exploitation.

(3) The Director may adjust or waive the adoption fee on determining that wild horses or burros in the custody of the Bureau of Land Management are unadoptable when the full adoption fee is required, and that it is in the public interest to adjust or waive the adoption fee stated in paragraph (a) of this section. The adjustment or waiver shall extend only to persons who are willing to maintain such animals privately, who demonstrate the ability to care for them properly, and who agree to comply with all rules and regulations relating to wild horses and burros.

(e) If the authorized officer determines that an adopted wild free-roaming horse or burro is being commercially exploited, inhumanely treated, or treated in a manner that violates a provision of the cooperative agreement, he may take immediate possession of the animal.

(f) If a wild free-roaming horse or burro that has been transferred for private maintenance or adoption dies, the transferee shall, within 7 days of the death, furnish the authorized officer with a veterinarian's written statement of the apparent cause of death.

(g) Persons, organizations, or agencies who receive wild free-roaming horses or burros that have been previ-

**§ 4740.5****43 CFR Ch II (10-1-85 Edition)**

ously transferred for private maintenance or adoption shall be subject to all the provisions of these regulations. No wild free-roaming horse or burro shall be transferred without the approval of the authorized officer.

(h) At the request of the transferee, the authorized officer may transfer custody of wild free-roaming horses and burros to another qualified applicant.

(Act of December 15, 1971, as amended (16 U.S.C. 1331-1340), the Act of June 26, 1934 (43 U.S.C. 315-315r) and the Federal Land Policy and Management Act of 1976 (43 U.S.C. 1701 *et seq.*); Act of September 8, 1959 (18 U.S.C. 47))

[44 FR 76985, Dec. 28, 1979. Redesignated and amended at 48 FR 9262, Mar. 4, 1983; 49 FR 20654, May 16, 1984]

**§ 4740.5 Granting of title.**

(a) The authorized officer may grant title to not more than four wild free-roaming horses and burros in any one year upon application of any qualified person, organization, or agency to whom these animals have been transferred for adoption. Applicants for granting of title must be of legal age in the State in which they reside.

(b) Persons, organizations, or agencies who have provided humane conditions, treatment, and care for the animals they have adopted after December 15, 1971, for at least one year under a cooperative agreement with the Bureau of Land Management are qualified to apply for title to the animals. The application for a title shall include a written statement of a licensed veterinarian attesting to the best of his knowledge that the animals have been given humane treatment and care preceding the filing of the application.

(c) The application for title shall be on a form prescribed by the Director, Bureau of Land Management, and shall be filed at the office specified on the form.

### **Subpart 4750—Management on Private Lands**

**§ 4750.1 Criteria for animals on private lands.**

Nothing in these regulations shall preclude a private landowner from al-

lowing wild free-roaming horses and burros to remain on his private lands so long as the animals were not willfully removed, enticed, or retained by him or his agent from the public lands.

**§ 4750.2 Maintenance.**

Any individual who actively maintains wild free-roaming horses and burros on his private lands shall notify the authorized officer and supply him with a reasonable approximation of their number and location and, when required by the authorized officer, a description of the animals. Thereafter, he shall furnish an annual report updating the information during the month of January. An individual will be considered to be actively maintaining wild free-roaming horses or burros if he takes measures of any kind designed to protect or enhance the welfare of the animals. No person shall maintain such animals except under cooperative agreement between the private landowner and the authorized officer setting forth the management and maintenance requirements including provisions for regulating disposal of excess animals.

**§ 4750.3 Removal.**

The authorized officer shall remove, as soon as he can make the necessary arrangements, wild free-roaming horses and burros, from private land at the request of the landowner where the private land is enclosed in a "legal fence." A "legal fence" for this purpose is one which complies with State standards and specifications. In "no fence districts" or other areas where the private landowner is not required by State statute to fence the private land to protect it from trespass by domestic livestock, the authorized officer shall, as soon as he can make the necessary arrangements, remove wild free-roaming horses or burros from such private land at the request of the landowner.

**Bureau of Land Management, Interior****§ 4760.2****Subpart 4760—Enforcement Provisions****§ 4760.1 Arrest.**

The Director of the Bureau of Land Management may authorize such employees as he deems necessary to arrest without warrant, any person committing in the presence of the employee a violation of the Act or of these regulations and to take such person immediately for examination or trial before an officer or court of competent jurisdiction. Any employee so designated shall have power to execute any warrant or other process issued by an officer or court of competent jurisdiction to enforce the provisions of the Act or these regulations.

**§ 4760.2 Penalties.**

In accordance with section 8 of the Act (16 U.S.C. 1338), any person who:

(a) Willfully removes or attempts to remove a wild free-roaming horse or burro from the public lands, without authority from the authorized officer, or

(b) Converts a wild free-roaming horse or burro to private use, without authority from the authorized officer, or

(c) Maliciously causes the death or harassment of any wild free-roaming horse or burro, or

(d) Processes or permits to be processed into commercial products the remains of a wild free-roaming horse or burro, or

(e) Sells, directly or indirectly, a wild free-roaming horse or burro, or the remains thereof which have not lost their status as a wild free-roaming horse or burro, or

(f) Uses a wild free-roaming horse or burro for commercial exploitation, or

(g) Causes or is responsible for the inhumane treatment of a wild free-roaming horse or burro, or

(h) Uses a wild free-roaming horse or burro for bucking stock, or

(i) Fails, upon written notice, to produce for inspection by an authorized officer those animals assigned to him for private maintenance under a cooperative agreement, or

(j) Fails to notify the authorized officer of the death of a wild free-roaming horse or burro within 7 days of death pursuant to § 4740.4-2(f) of this title, or

(k) Removes or attempts to remove, alters or destroys any official mark identifying a wild horse or burro, or its remains, or

(l) Being the assignee of a wild free-roaming horse or burro, or having charge or custody of the animal, abandons the animal without making arrangements for necessary food, water and shelter, or

(m) Being the assignee of a wild free-roaming horse or burro, or having charge or custody of the animal, fails to diligently pursue in an attempt to capture the escaped animal, or

(n) Accepts for slaughter or destruction a horse or burro bearing an official Bureau of Land Management identification mark, and which is not accompanied by a certificate that title to the animal has been transferred, or

(o) After acceptance of an animal for slaughter or destruction, fails to retain for one year the certificate of title to a horse or burro bearing an official Bureau of Land Management identification mark, or

(p) Willfully violates any provisions of the regulations under Group 4700, shall be subject to a fine of not more than \$2,000 or imprisonment for not more than 1 year, or both. Any person so charged with such violation by the authorized officer may be tried and sentenced by a U.S. commissioner or magistrate, designated for that purpose by the court by which he was appointed, in the same manner and subject to the same conditions as provided in section 3401, Title 18, U.S.C.

[41 FR 9879, Mar. 8, 1976, as amended at 44 FR 76987, Dec. 28, 1979]

## **Exhibit C**

Copy of 51 Fed. Reg. 7410, dated March 3, 1986

# Forest Service Federal Register

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**Monday  
March 3, 1986**

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## **Part VI**

## **Department of the Interior**

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### **Bureau of Land Management**

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#### **43 CFR Part 4700**

#### **Revision of Existing Regulations on Protection, Management, and Control of Wild Free-Roaming Horses and Burros; Final Rule**

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## DEPARTMENT OF THE INTERIOR

## Bureau of Land Management

## 43 CFR Part 4700

[Circular No. 2577]

**Revision of Existing Regulations on Protection, Management, and Control of Wild Free-Roaming Horses and Burros****AGENCY:** Bureau of Land Management, Interior.**ACTION:** Final rulemaking.

**SUMMARY:** This final rulemaking revises the provisions on wild free-roaming horses and burros in Part 4700 to reduce the regulatory burden on the public, to clarify the management procedures of the Bureau of Land Management as they affect the public, to remove unnecessary provisions, and to improve the organization of the regulations.

**EFFECTIVE DATE:** April 2, 1986.

**ADDRESS:** Inquiries or suggestions should be sent to: Director (250), Bureau of Land Management, Room 901, Premier Building, Department of the Interior, Washington, DC 20240.

**FOR FURTHER INFORMATION CONTACT:** John S. Boyles (202) 653-9215.

**SUPPLEMENTARY INFORMATION:** A proposed rulemaking to revise the existing regulations on the protection, management, and control of wild free-roaming horses and burros on public lands was published in the *Federal Register* on December 18, 1984 (49 FR 49252). Comments were invited for a period of 60 days ending February 19, 1985, during which period a total of 19 comments were received, with 10 from associations, 6 from Federal agency offices, 2 from State governments, and 1 from a Member of Congress. All of the comments have been given careful consideration during the decisionmaking process on this final rulemaking.

The comments contained discussions of specific sections of the proposed rulemaking and in many instances recommended changes, some of which have been adopted in this final rulemaking. This preamble will discuss only those sections that were the subject of specific comments or were changed.

*Section 4700.0-2 Objectives.*

One comment suggested that the objectives should be amended to conform more closely to the statutory objectives stated in the Act of December 15, 1971, as amended (16 U.S.C. 1331-1340) (the Act). Based on this comment, the section has been amended to incorporate the statutory requirement that wild horses and burros be managed

"as an integral part of the natural system of the public lands" under the principle of multiple use.

*Section 4700.0-5 Definitions.*

Several comments addressed the proposed definitions of the terms "appropriate management level" and "excess animals." Most of the comments criticized the proposed definitions of the terms as being inconsistent with the statutory definitions and intent, and urged that the statutory language be used. In response to these comments, the definitions of both terms have been removed from the final rulemaking. The language of the statute will govern management.

One comment questioned whether the definition of "authorized officer" allows for appeals by the public to higher authority. The definition merely defines who is to carry out the provisions of this rulemaking, and has no bearing on appeals under the Administrative Procedure Act or 43 CFR Part 4 of any decision made under these regulations. The definition is not changed in the final rulemaking.

Two comments addressed the definitions for "band" and "herd", urging that the former be removed and that the latter be conformed to the language in the Act. In response to these comments, the definitions of both terms have been removed from the rulemaking. "Herd" is defined in the Act. "Band" is not used in the text of the final rulemaking, and thus does not require definition.

Several comments addressed the definition of "commercial exploitation," urging that it be expanded to include slaughtering and processing the remains of horses and burros, and not be limited to using the wild characteristics of the animals for financial gain. Slaughtering a wild horse or burro is prohibited by § 4770.1(c) of this rulemaking, and selling a wild horse or burro or its remains is prohibited by § 4770.1(d). Processing of the remains of a wild horse or burro is addressed in § 4730.2, which prohibits receiving compensation for remains, but allows disposal of remains through rendering. The definition is retained unchanged.

Several comments objected to the proposed definition of "humane treatment," which required that handling be consistent with "standard animal husbandry practices." Because no specific group of husbandry practices can be presented as a "standard," the word has been replaced in the final rulemaking with the phrase "accepted by the veterinary community." Accepted animal husbandry practices are those outlined in textbooks on the subject. The

BLM has relied primarily on the following:

1. Bradley, Melvin. *Horses: A Practical and Scientific Approach*. New York: McGraw-Hill, Inc., 1981.

2. Ensminger, M.E. *Horses and Horsemanship*, 5th ed. Danville, Illinois: The Interstate Printers and Publishers, Inc., 1977.

In addition, the adjectives "kind" and "merciful" have been removed because they are redundant, given the requirement that handling not cause unnecessary stress or suffering.

Another comment stated that "stress," referred to in the definition, is undefined. In this and all other cases where common words or expressions are used, the ordinary dictionary definition is intended to be applied.

Several comments addressed the definition of "inhumane treatment." Some stated a preference for the definition in the existing regulations; others stated that requiring the treatment to be intentional is too restrictive, and that it should be defined to include inflicting pain and suffering. The word "death" has been replaced in the definition in the final rulemaking with "undue suffering", in response to one of the comments, and to allow the authorized officer to destroy animals in appropriate circumstances. The definition has also been expanded to include negligent as well as intentional behavior, and the word "standard" is replaced for the reasons stated above. However, the definition in the existing regulations is not retained because it may be too restrictive, in that it includes a specific list of proscribed acts or omissions without stating clearly that other acts or omissions may constitute inhumane treatment.

One comment suggested that the definition of "old wild horse or burro" should be amended to make it clear that, to be subject to destruction as an act of mercy because of physical deterioration, the animal's deterioration must have rendered it unable to fend for itself. This suggestion has been adopted in the final rulemaking.

One comment stated that the definition of "wild horses and burros" should be amended to include their progeny. This change has not been adopted in the final rulemaking because it would include animals born after their mothers have been placed under a Private Maintenance and Care Agreement. Such animals have never been "unbranded or unclaimed horses and burros on public lands of the United States," the statutory definition of wild horses and burros. The final rulemaking

does address progeny born while the mothers are on public land or at adoption centers. In response to a comment, the definition has been amended to assure that the term includes the characteristic "free-roaming".

One comment suggested including in the rulemaking a definition for "herd area." This suggestion has been adopted in the final rulemaking. Two comments urged that a definition of "malicious harassment" be included. This request has not been adopted in the final rulemaking. Instead, the prohibition in § 4770.1(a) has been amended to prohibit negligent as well as malicious injury or harassment. The terms negligence and malice are both well-defined in the law.

#### *Section 4700.0-6 Policy.*

Several comments addressed paragraph (a) of this section, urging that the policy should emphasize that wild horses and burros should be managed as one of the multiple uses of the public lands, not as a dominant use limited only by the capacity of the habitat. Other comments urged that more than just museum-exhibit populations should be maintained on the public lands. Paragraph (a) of § 4700.0-6 has been amended in the final rulemaking to accommodate both suggestions, that is, to require that populations be self-sustaining and that populations of horses and burros be kept in balance with other uses as well as the productive capacity of the habitat.

Several comments addressed paragraph (b) of this section, urging that the language on forage allocation in the existing regulations (43 CFR 4700.0-6(c)) be retained. Other comments stated that the word "comparably" is vague and should be replaced by "equivalent" in describing how wild horses and burros will be considered in relation to other resources in formulating land use plans. Specific provision for forage allocation is not necessary because the policy is clearly stated that wild horse and burro management will maintain self-sustaining populations. This cannot be done without adequate forage. The word "comparably" is used in the existing regulations to require all resource values to be considered in proportion to their presence on the land, competition with other resources, and the interest of the public in them. Assigning equal or equivalent weight to all resources, as some comments suggested, would not allow varying circumstances to be treated appropriately. The paragraph is not changed in the final rulemaking.

Two comments addressed paragraph (c) of this section, urging that it be policy to manage wild horses and burros at the

minimum feasible level, and expressing concern that maintaining free-roaming behavior of the animals may be inconsistent with multiple use of the public lands. Failure to maintain the free-roaming nature of the animals would be contrary to the policy established by the Act. The requirement that management shall be at the minimum level to attain planning objectives is contained in § 4710.4. It is not necessary to amend this provision.

One comment urged that paragraph (d) of this section be amended to preclude cooperative arrangements for the management of wild horses and burros. The Act specifically authorizes the Secretary of the Interior to enter into cooperative agreements with State and local governments and with individual landowners to attain management objectives. The paragraph is retained in the final rulemaking. It should be understood that § 4710.7 retains the statutory provisions for individuals to maintain wild horses and burros on their private land.

Although there were no comments on paragraph (e), it has been amended by removing the word "nationwide" in reference to adoption centers, to avoid misleading the public into expecting to find adoptable animals in every community around the country.

In response to several comments, and to make it consistent with § 4750.4-2(b), paragraph (f) has been amended to state that adoption fees will "normally" be required.

One comment asked for a policy declaration on removal of animals from private land. Such a declaration is unnecessary because the procedure is clearly stated in § 4720.2-1. Another comment asked that management guidelines be included in the policy statement. Such guidelines are more appropriately stated in manuals for the use of field personnel of the Bureau. Neither suggestion has been adopted in the final rulemaking.

#### *Section 4710.1 Land use planning.*

Several comments addressed this section. One expressed general support, another asked for language requiring that management activities comply with law and Congressional intent, and a third urged that management activities be included in approved land use plans. In response to the second comment, management activities shall be in accordance with the law regardless of any criteria in regulations. In response to the third, the paragraph has been amended by substituting the words "in accordance" for "compatible" in describing the relationship of management actions to land use plans. Management activities, including the

development of herd management area plans, must not only be compatible with the land use plan but must also reflect specific guidance derivable from the land use plan on the subjects of resource allocation, relationships between wild horses and burros and other recognized uses, and critical resource use levels that would require modification of the plan's multiple-use prescriptions.

#### *Section 4710.2 Inventory and monitoring.*

Several comments urged that the authorized officer be required to address the numbers of horses and burros that existed in herd areas in 1971 as a basis for further management. This suggestion is not adopted in the final rulemaking. There is no indication in the Act or its legislative history that herds should be managed at their 1971 size or any other specific level. Furthermore, although estimates of 1971 population levels have been made, they are at best conjectural and highly unreliable. It is more appropriate to allow the authorized officer the flexibility to determine appropriate management levels based on analysis of competing land uses, forage availability, and public concern.

Another comment urged that the authorized officer be required to monitor herd and habitat characteristics regardless of whether herd management areas are established. This suggestion has not been adopted in the final rulemaking, because this type of information is useful only when herds are to be managed in the long term. This provision has been amended to delete the list of items to be inventoried and monitored on herd management areas, because these will vary depending on the objectives in the herd management area plan.

#### *Section 4710.3-1 Herd management areas.*

Several comments addressed this section, expressing concern that it could be interpreted to direct every District Manager of the Bureau of Land Management to establish herd management areas. This provision has been amended to alleviate this concern and to clarify that herd management areas shall be established only where herds existed in 1971. One comment suggested that the effect on nearby private land of management for wild horses and burros should be taken into account in delineating herd management areas. This suggestion has been adopted in the final rulemaking.

#### *Section 4710.3-2 Wild horse and burro ranges.*

Several comments objected to this section as implying that numerous wild horse and burro ranges will be

established on public lands. Such ranges are specifically provided for by law (16 U.S.C. 1333(a)), and will be established only upon completion of the appropriate planning process, including public participation. The section has been retained, with editorial changes, in the final rulemaking.

*Section 4710.4 Constraints on management.*

Several comments addressed this section, pointing out that limiting wild horses and burros to their 1971 "yearlong" habitat could effectively eliminate most of their actual habitat from management as herd areas, due to their seasonal use of some areas. The section has been amended to remove the reference to yearlong habitat. In this connection, a definition has been added for "herd area" in § 4700.0-5. Another change has been incorporated to make it clear that management will not be restricted to herd areas, but will rather be undertaken with the objective of limiting animal distribution to herd areas by controlling herd size to prevent habitat from being overpopulated.

*Section 4710.5 Closure to livestock grazing.*

Numerous comments addressed paragraph (a) of this section, either opposing it as inconsistent with multiple use management, or urging that it be amended to provide additional protection for wild horses and burros. Actions under this section are discretionary with the authorized officer and subject to public consultation. The provision is necessary to allow the authorized officer to meet the needs of all users of the public lands, including wild horses and burros, and is retained unamended in the final rulemaking.

Several comments asked that paragraph (b) of this section be amended to allow camp horses or riding stock to graze on public lands inhabited by wild horses and burros. The paragraph has been amended to make it clear that herd areas are closed only to grazing under permit or lease by domestic horses and burros, and not to pack or camp horses. In addition, for the latter it is the normal practice that outfitters carry fodder for their animals with them, or limit their grazing by tying or hobbling them, so interference by these animals with or consumption of forage needed by wild horses and burros is minimal.

As a result of concerns expressed in numerous comments, paragraph (c) of this section has been rewritten in the final rulemaking to clarify the limits on the authority of the authorized officer. Sufficient authorities for this provision are found in the Taylor Grazing Act and the Federal Land Policy and

Management Act, as well as the Wild Free-Roaming Horse and Burro Act. Any notice of closure will be subject to the normal administrative appeal process.

*Section 4710.6 Removal of unauthorized livestock in or near areas occupied by wild horses or burros.*

In response to public comment, this section has been amended to make it clear that any conditions established for the removal of unauthorized livestock would apply only to removal from public lands.

*Section 4710.7 Maintenance of wild horses and burros on privately controlled lands.*

This section has been amended to remove the requirement that private maintenance occur only on unfenced land, because that requirement is not supported by law. Landowners may voluntarily provide for and maintain wild horses and burros that freely move onto their land, whether it is fenced or not.

*Section 4720.1 Removal.*

One comment discussed the term "current information" in this section, and suggested that detailed language in the statute at 16 U.S.C. 1333(b)(2) be included in the regulation. The authorized officer is equally bound by the statute and the regulations, and there is no need to repeat the requirements of the law in the regulations. The comment is not adopted in the final rulemaking.

An editorial change has been made in § 4720.1(b), adding the word "humanely" to meet the requirements of law.

Three comments addressed paragraph (c) of this section, 2 of them urging that it be removed from the rulemaking, and 1 asking that a time limit be set for holding captured animals. Section 1333(b)(2)(C) of the Act requires the humane destruction of excess wild horses and burros. Even if the section were removed from the rulemaking, the responsibility to carry out the law would remain. Retaining the paragraph in the rulemaking makes it clear that the Secretary may impose standards for humane destruction of excess animals. Setting a time limit on holding captured animals would deprive the authorized officer of flexibility needed to meet various circumstances, such as temporary lulls in adoption demand.

*Section 4720.2-1 Removal of strayed animals from private lands.*

Several comments addressed this section, stating that the information requested from private landowners seeking removal of strayed animals from their land was too burdensome and should be supplied only in the discretion of the landowner. However, it would be impossible for the authorized officer to

be responsive to a request for removal of strayed animals without specific information about the number of animals involved, their location and that of the private lands, and the dates the animals were observed. Requiring this information would enable the authorized officer to determine the appropriate agency action and to assign to each individual request its appropriate priority. Therefore, the final rulemaking makes the content of such requests mandatory by replacing the word "should" with "shall." Other comments urged that the regulation require immediate or priority removal of strayed animals. The comments are not adopted in the final rulemaking, because circumstances may make such action impossible. Requiring that removal be accomplished as soon as practicable commits the Bureau to expeditious removal of strayed animals.

*Section 4720.2-2 Removal of excess animals from private lands.*

One comment stated that the authorized officer should not be required to obtain written permission from the owners of unimproved private lands intermingled with public lands in herd areas when removing excess animals. This comment has been adopted in the final rulemaking by removing the phrase "or using". A sentence has been added to make it clear that flying aircraft over a parcel of land does not constitute entry.

*Section 4730.1 Destruction.*

Several comments addressed this section, observing both the Congressional intent that destruction be a tool for managing wild horses and burros, and the legislatively drawn distinction between destruction of excess animals and destruction of old, sick, and lame animals as an act of mercy. The section has been rewritten in the final rulemaking to conform to the statute in these respects.

*Section 4730.2 Disposal of remains.*

Several comments addressed this section, some urging that it prohibit processing of remains, and others that some provision be made for compensating individuals for disposal of remains. Neither suggestion has been adopted in the final rulemaking. To provide consistency with the Act, and to remove the ambiguity between the words "carcasses" and "remains", the former has been replaced with the latter wherever it appeared. Processing remains is the most appropriate way of disposing of them and complies with the law so long as neither the Bureau nor any individual receives compensation for conveying the remains. Although no compensation can be received for

transfer of the remains, once the remains have been sanitarily rendered in accordance with normal local or State standards, the renderer may sell the end products, which are no longer considered remains as used in the Act.

In response to one comment, the section has been amended to make it clear that the Bureau is not required to dispose of remains of animals that die on the open public range.

#### *Section 4740.1 Use of motor vehicles or aircraft.*

This section has been amended to reflect numerous comments stating generally that management activities should be conducted in a humane manner, and to clarify that a public hearing shall be held before using helicopters or motor vehicles in the management of wild horses and burros.

#### *Section 4740.2 Standards for vehicles used for transport of wild horses and burros.*

Two comments urged that this section be amended to provide specific standards for head room in horse trailers and to require that food given to animals in transit be compatible with what they are accustomed to. Such specificity is unnecessary in these regulations. Bureau personnel are trained to judge whether trailers are suitable for transporting individual animals, and allowing feed rations to change while remaining adequate may help adopted animals adjust to their new environments.

#### *Section 4750.2-1 Health and identification requirements.*

One comment suggested that verification of an animal's soundness and health, required in paragraph (a) of this section, should be obtained from a licensed veterinarian. This recommendation would eliminate the possibility of obtaining a verification from other qualified individuals. Another comment recommended that the provision for tests, immunizations, and worming be removed from the rulemaking because they are not required by Federal law. These tests may not be required by Federal law, but are required by the laws of many of the public land States. Neither recommendation has been adopted in the final rulemaking.

One comment sought the removal of the provision in paragraph (c) for freeze-marking unweaned foals, because of possible stress on the young animals and because of doubt as to their status as free-roaming if born after their dams have been rounded up. This comment has not been adopted in the final rulemaking. Foals born in captivity but before their dams are adopted into private maintenance are considered free-

roaming for purposes of these regulations. Also, while freeze-marking may involve some stress, it is the most humane and cost-efficient way of providing the necessary identification of these animals.

#### *Section 4750.3-1 Application for private maintenance of wild horses and burros.*

Several comments urged that the provision for a nonrefundable filing fee to accompany the application be removed from the regulations, on the grounds that imposing a fee would tend to discourage adoptions. The recommendation is adopted in the final rulemaking.

#### *Section 4750.3-2 Qualification standards for private maintenance.*

One comment addressed paragraph (a)(1) of this section, asking that legal age be determined by where an applicant is a citizen or permanent resident. To avoid the confusion inherent in making this kind of determination, the provision has been amended in the final rulemaking to require only that the applicant be at least 18 years old.

One comment requested that the rulemaking state the minimum acceptable standards for facilities for animals in private maintenance. Paragraph (a)(3) has been rewritten to state those standards.

#### *Section 4750.3-3 Supporting information and certification for private maintenance of more than 4 wild horses and burros.*

The opening paragraph of § 4750.3-3(a) has been rewritten for purposes of clarification and stricter compliance with the judicial settlement in *American Horse Protection Association, Inc., et al v. Watt, et al* (the AHPA settlement). The amendment makes it clear that the facilities must be physically inspected by a person determined by the authorized officer to be qualified.

Paragraph (a)(1) of this section has been amended to cross-refer to the standards contained in the previous section, in order to make clear the responsibilities of those seeking to adopt more than 4 horses or burros. Paragraph (b) has been rewritten to be more consistent with the AHPA settlement. In the final rulemaking this paragraph makes it clear that the required information is to be provided by holders of powers of attorney to adopt animals on behalf of members of a group.

#### *Section 4750.4-1 Private Maintenance and Care Agreement.*

Paragraphs (b), (c), and (d) of this section have been removed in the final rulemaking, and the remaining paragraphs redesignated, to eliminate

duplication between the provisions stated in the agreement required by this section and the acts prohibited in § 4770.1.

One comment suggested that paragraph (e) of the proposed rulemaking be amended to prohibit long-term or indefinite as well as permanent transfers of adopted animals without prior approval by the authorized officer. This comment has been adopted in the final rulemaking in paragraph (b) by imposing a 30-day limit on transfers without such prior approval.

One comment suggested that adopters be given a definite time within which an animal must be made available for inspection after written request by the authorized office under paragraph (f). This recommendation has been adopted in the final rulemaking by imposing a 7-day deadline.

Two comments suggested that paragraph (g) of the proposed rulemaking ((d) in this final rulemaking) be amended to require a veterinarian's certificate in all cases of the death of an adopted animal. This suggestion has not been adopted in the final rulemaking, but it remains within the discretion of the authorized officer to require such a certificate.

One comment requested more specificity in paragraph (h) of this section in the proposed rulemaking. In response, the paragraph has been amended to make it clear that it is the adopter's financial responsibility to care for animals covered by the Private Maintenance and Care Agreement. New paragraphs have been added to clarify that the adopter is responsible for managing adopted animals, for damages caused by them, for rounding up strays, and for disposal of dead animals. In response to a comment, a requirement has been added that the adopter notify the authorized office of any change of address.

#### *Section 4750.4-2 Adoption fee.*

Paragraph (a) of this section has been amended in the final rulemaking to conform to the amendment of § 4750.3-1, which removed the application fee. An editorial change has also been made to make it clear that only unweaned foals are not subject to the adoption fee.

#### *Section 4750.4-3 Request to terminate Private Maintenance and Care Agreement.*

In response to a comment, this section has been amended to clarify that adopted animals may be transferred directly to a new adopter, with the approval of the authorized officer, and that the officer need not take physical possession of animals involved in such transfers.

#### *Section 4750.4-4 Replacement animals.*

One comment from a Bureau field office suggested shortening from 60 to 10 days the period within which an adopter can obtain an animal to replace one that has died or had to be destroyed due to a condition that existed at the time of adoption. This suggestion was not adopted. Instead, because some conditions that may cause death after a 60-day period may have existed at the time of adoption, this section has been amended to extend the time to 6 months.

#### *Section 4750.5 Application for title to wild horses and burros.*

Several comments objected to the provision in paragraph (a) of this section allowing adopters to acquire title to more than 4 animals in one year as not being supported by section 1333(c) of the Act. The provision has been removed in the final rulemaking.

One comment requested that paragraph (b) of this section be amended to state in some detail the required contents of the veterinarian's statement to be supplied by the applicant for title. In response to this comment, the word "humane" has been inserted in front of "treatment," so that the required certification will incorporate the elements listed in the definition (§ 4700.0-5(g)) of "human treatment," i.e., handling compatible with standard animal husbandry practices.

Another change has been made in the final rulemaking affecting title application. Application for title has been incorporated in the adoption process so that an adopter applies for title to an animal automatically at the time the Private Maintenance and Care Agreement is signed. The final sentence of the paragraph has been removed as redundant.

#### *Section 4760 Compliance with the Private Maintenance and Care Agreement.*

A new paragraph (b) has been added to this section to conform it to the terms of the settlement in *American Horse Protection Association v. Watt*. Paragraph (b) requires the authorized officer to verify compliance with the Private Maintenance and Care Agreement when one adopter has acquired 25 or more animals, or 25 or more are maintained in one place.

One comment pointed out that paragraph (b) of this section in the proposed rulemaking (relettered (c) in the final rulemaking), when read in conjunction with § 4750.4-1(f), requires the authorized officer investigating a complaint about the care, treatment, or use of an adopted animal to notify the adopter in writing before inspecting the

animal or the facilities where it is maintained. This is a correct statement of the requirement, which is not changed in the final rulemaking. However, the authorized officer may enlist the assistance of Federal or local law enforcement authorities, who may with proper cause obtain a search warrant and investigate without such warning.

#### *Section 4770.1 Prohibited acts.*

One comment stated that paragraph (a) of this section demonstrates the need for a definition of "malicious harassment," and another stated that the prohibition in this paragraph would be very hard to enforce because of the difficulty of proving malicious intent. The paragraph has been amended to prohibit negligent as well as malicious injury of a wild horse or burro.

The separate prohibition against using a wild horse or burro for bucking stock has been removed from the final rulemaking. Any use considered to be inhumane is already prohibited in § 4770.1(e), and use that takes advantage of an animal's characteristic of wildness is prohibited in § 4770.1(e).

A paragraph has been added to this section prohibiting the violation of orders, terms, or conditions established by the authorized officer. Other changes of an editorial nature have been made.

#### *Section 4770.2 Civil penalties*

In response to several comments that this section singled out holders of grazing permits for discriminatory treatment, paragraph (a) of this section has been amended to apply to all permittees or lessees on the public lands.

The principal author of this final rulemaking is John S. Boyles, Division of Wild Horses and Burros, assisted by the staff of the Office of Legislation and Regulatory Management, Bureau of Land Management.

It is hereby determined that this rulemaking does not constitute a major Federal action significantly affecting the quality of the human environment and that no detailed statement pursuant to section 102(2)(C) of the National Environmental Policy Act of 1969 (42 U.S.C. 4332(2)(C)) is required.

The Department of the Interior has determined that this document is not a major rule under Executive Order 12291 and that it will not have a significant economic effect on a substantial number of small entities under the Regulatory Flexibility Act (5 U.S.C. 601 et seq.). A limited number of veterinarians, cooperative extension agents, and humane officials may be insignificantly affected by the rulemaking. The certification required for adopters to receive title is needed on a nonrecurring basis. The changes allow adopters discretion to choose the official from

whom they obtain a certification, resulting in some cost savings. Adopters are required to pay a fee to obtain the animals and to provide information to show their ability to provide humane transport, facilities, and care for the animals. An insignificant number of individuals may be deterred from participating because of the fee or qualification standards for humane care.

Information collection requirements for administering these regulations have been approved by the Office of Management and Budget and assigned clearance number 1004-0042.

#### **List of Subjects in 43 CFR Part 4700**

Advisory committees, Aircraft, Intergovernmental relations, Penalties, Public lands, Range management, Wild horses and burros, Wildlife.

Under the provisions of the Act of September 8, 1959 (18 U.S.C. 47), the Act of December 15, 1971, as amended (16 U.S.C. 1331-1340), the Federal Land Policy and Management Act of 1976 (43 U.S.C. 1701 et seq.), and the Act of June 28, 1934, as amended (43 U.S.C. 315), Part 4700, Subchapter D, Chapter II, Title 43 of the Code of Federal Regulations is revised to read as set forth below.

Dated: February 7, 1986.

J. Steven Griles,

*Assistant Secretary of the Interior.*

#### **GROUP 4700—WILD FREE-ROAMING HORSE AND BURRO MANAGEMENT**

**Note.**—The information collection requirements contained in Group 4700 have been approved by the Office of Management and Budget and assigned clearance number 1004-0042. The information is being collected to permit the authorized officer to remove wild horses and burros from private land and to determine whether an application for adoption of and title to wild horses or burros should be granted. Responses are required to obtain benefits.

#### **PART 4700—PROTECTION, MANAGEMENT, AND CONTROL OF WILD FREE-ROAMING HORSES AND BURROS**

##### **Subpart 4700—General**

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##### **Subpart 4710—Management Considerations**

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## Sec.

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- 4710.7 Maintenance of wild horses and burros on privately controlled lands.

**Subpart 4720—Removal**

- 4720.1 Removal of excess animals from public lands.
- 4720.2 Removal of strayed or excess animals from private lands.
- 4720.2-1 Removal of strayed animals from private lands.
- 4720.2-2 Removal of excess animals from private lands.

**Subpart 4730—Destruction of Wild Horses or Burros and Disposal of Remains**

- 4730.1 Destruction.
- 4730.2 Disposal of remains.

**Subpart 4740—Motor Vehicles and Aircraft**

- 4740.1 Use of motor vehicles or aircraft.
- 4740.2 Standards for vehicles used for transport of wild horses and burros.

**Subpart 4750—Private Maintenance**

- 4750.1 Private maintenance.
- 4750.2 Health, identification, and inspection requirements.
- 4750.2-1 Health and identification requirements.
- 4750.2-2 Brand inspection.
- 4750.3 Application requirement for private maintenance.
- 4750.3-1 Application for private maintenance of wild horses and burros.
- 4750.3-2 Qualification standards for private maintenance.
- 4750.3-3 Supporting information and certification for private maintenance of more than 4 wild horses or burros.
- 4750.3-4 Approval or disapproval of applications.
- 4750.4 Private maintenance of wild horses and burros.
- 4750.4-1 Private maintenance and care agreement.
- 4750.4-2 Adoption fee.
- 4750.4-3 Request to terminate private maintenance and care agreement.
- 4750.4-4 Replacement animals.
- 4750.5 Application for title to wild horses and burros.

**Subpart 4760—Compliance**

- 4760.1 Compliance with the Private Maintenance and Care Agreement.

**Subpart 4770—Prohibited Acts, Administrative Remedies, and Penalties**

- 4770.1 Prohibited acts.
- 4770.2 Civil penalties.
- 4770.3 Administrative remedies.
- 4770.4 Arrest.
- 4770.5 Criminal penalties.

Authority: Act of Dec. 15, 1971, as amended (16 U.S.C. 1331-1340). Act of Oct. 21, 1976 (43 U.S.C. 1701 et seq.). Act of Sept. 8, 1959 (18 U.S.C. 47). Act of June 28, 1934 (43 U.S.C. 315).

**Subpart 4700—General****§ 4700.0-1 Purpose.**

The purpose of these regulations is to implement the laws relating to the protection, management, and control of wild horses and burros under the administration of the Bureau of Land Management.

**§ 4700.0-2 Objectives.**

The objectives of these regulations are management of wild horses and burros as an integral part of the natural system of the public lands under the principle of multiple use; protection of wild horses and burros from unauthorized capture, branding, harassment or death; and humane care and treatment of wild horses and burros.

**§ 4700.0-3 Authority.**

The Act of September 8, 1959 (18 U.S.C. 47); the Act of December 15, 1971, as amended (16 U.S.C. 1331-1340); the Federal Land Policy and Management Act of 1976 (43 U.S.C. 1711, 1712, and 1734); the Act of June 28, 1934, as amended (43 U.S.C. 315); and the National Environmental Policy Act of 1969 (42 U.S.C. 4321, 4331-4335, and 4341-4347).

**§ 4700.0-5 Definitions.**

As used in this part, the term:

(a) "Act" means the Act of December 15, 1971, as amended (16 U.S.C. 1331-1340), commonly referred to as the Wild Free-Roaming Horse and Burro Act.

(b) "Authorized officer" means any employee of the Bureau of Land Management to whom has been delegated the authority to perform the duties described herein.

(c) "Commercial exploitation" means using a wild horse or burro because of its characteristics of wildness for direct or indirect financial gain.

Characteristics of wildness include the rebellious and feisty nature of such animals and their defiance of man as exhibited in their undomesticated and untamed state. Use as saddle or pack stock and other uses that require domestication of the animal are not commercial exploitation of the animals because of their characteristics of wildness.

(d) "Herd area" means the geographic area identified as having been used by a herd as its habitat in 1971.

(e) "Humane treatment" means handling compatible with animal husbandry practices accepted in the veterinary community, without causing unnecessary stress or suffering to a wild horse or burro.

(f) "Inhumane treatment" means any intentional or negligent action or failure

to act that causes stress, injury, or undue suffering to a wild horse or burro and is not compatible with animal husbandry practices accepted in the veterinary community.

(g) "Lame wild horse or burro" means a wild horse or burro with one or more malfunctioning limbs that permanently impair its freedom of movement.

(h) "Old wild horse or burro" means a wild horse or burro characterized because of age by its physical deterioration and inability to fend for itself, suffering, or closeness to death.

(i) "Private maintenance" means the provision of proper care and humane treatment to excess wild horses and burros by qualified individuals under the terms and conditions specified in a Private Maintenance and Care Agreement.

(j) "Public lands" means any lands or interests in lands administered by the Secretary of the Interior through the Bureau of Land Management.

(k) "Sick wild horse or burro" means a wild horse or burro with failing health, infirmity or disease from which there is little chance of recovery.

(l) "Wild horses and burros" means all unbranded and unclaimed horses and burros that use public lands as all or part of their habitat, or that have been removed from these lands by the authorized officer but have not lost their status under section 3 of the Act. Where it appears in this part the term "wild horses and burros" is deemed to include the term "free-roaming".

**§ 4700.0-6 Policy.**

(a) Wild horses and burros shall be managed as self-sustaining populations of healthy animals in balance with other uses and the productive capacity of their habitat.

(b) Wild horses and burros shall be considered comparably with other resource values in the formulation of land use plans.

(c) Management activities affecting wild horses and burros shall be undertaken with the goal of maintaining free-roaming behavior.

(d) In administering these regulations, the authorized officer shall consult with Federal and State wildlife agencies and all other affected interests, to involve them in planning for and management of wild horses and burros on the public lands.

(e) Healthy excess wild horses and burros for which an adoption demand by qualified individuals exists shall be made available at adoption centers for private maintenance and care.

(f) Fees shall normally be required from qualified individuals adopting

excess wild horses and burros to defray part of the costs of the adoption program.

#### **Subpart 4710—Management Considerations**

##### **§ 4710.1 Land use planning.**

Management activities affecting wild horses and burros, including the establishment of herd management areas, shall be in accordance with approved land use plans prepared pursuant to Part 1600 of this title.

##### **§ 4710.2 Inventory and monitoring.**

The authorized officer shall maintain a record of the herd areas that existed in 1971, and a current inventory of the numbers of animals and their areas of use. When herd management areas are established, the authorized officer shall also inventory and monitor herd and habitat characteristics.

##### **§ 4710.3 Management areas.**

###### **§ 4710.3-1 Herd management areas.**

Herd management areas shall be established for the maintenance of wild horse and burro herds. In delineating each herd management area, the authorized officer shall consider the appropriate management level for the herd, the habitat requirements of the animals, the relationships with other uses of the public and adjacent private lands, and the constraints contained in § 4710.4. The authorized officer shall prepare a herd management area plan, which may cover one or more herd management areas.

###### **§ 4710.3-2 Wild horse and burro ranges.**

Herd management areas may also be designated as wild horse or burro ranges to be managed principally, but not necessarily exclusively, for wild horse or burro herds.

##### **§ 4710.4 Constraints on management.**

Management of wild horses and burros shall be undertaken with the objective of limiting the animals' distribution to herd areas. Management shall be at the minimum level necessary to attain the objectives identified in approved land use plans and herd management area plans.

##### **§ 4710.5 Closure to livestock grazing.**

(a) If necessary to provide habitat for wild horses or burros, to implement herd management actions, or to protect wild horses or burros, to implement herd management actions, or to protect wild horses or burros from disease, harassment or injury, the authorized officer may close appropriate areas of

the public lands to grazing use by all or a particular kind of livestock.

(b) All public lands inhabited by wild horses or burros shall be closed to grazing under permit or lease by domestic horses and burros:

(c) Closure may be temporary or permanent. After appropriate public consultation, a Notice of Closure shall be issued to affected and interested parties.

##### **§ 4710.6 Removal of unauthorized livestock in or near areas occupied by wild horses or burros.**

The authorized officer may establish conditions for the removal of unauthorized livestock from public lands adjacent to or within areas occupied by wild horses or burros to prevent undue harassment of the wild horses or burros. Liability and compensation for damages from unauthorized use shall be determined in accordance with subpart 4150 of this title.

##### **§ 4710.7 Maintenance of wild horses and burros on privately controlled lands**

Individuals controlling lands within areas occupied by wild horses and burros may allow wild horses or burros to use these lands. Individuals who maintain wild free-roaming horses and burros on their land shall notify the authorized officer and shall supply a reasonable estimate of the number of such animals so maintained. Individuals shall not remove or entice wild horses or burros from the public lands.

#### **Subpart 4720—Removal**

##### **§ 4720.1 Removal of excess animals from public lands.**

Upon examination of current information and a determination by the authorized officer that an excess of wild horses or burros exists, the authorized officer shall remove the excess animals immediately in the following order.

(a) Old, sick, or lame animals shall be destroyed in accordance with Subpart 4730 of this title;

(b) Additional excess animals for which an adoption demand by qualified individuals exists shall be humanely captured and made available for private maintenance in accordance with Subpart 4750 of this title; and

(c) Remaining excess animals for which no adoption demand by qualified individuals exists shall be destroyed in accordance with subpart 4730 of this title.

##### **§ 4720.2 Removal of strayed or excess animals from private lands.**

###### **§ 4720.2-1 Removal of strayed animals from private lands.**

Upon written request from the private landowner to any representative of the Bureau of Land Management, the authorized officer shall remove stray wild horses and burros from private lands as soon as practicable. The private landowner may also submit the written request to a Federal marshal, who shall notify the authorized officer. The request shall indicate the numbers of wild horses or burros, the date(s) the animals were on the land, legal description of the private land, and any special conditions that should be considered in the gathering plan.

###### **§ 4720.2-2 Removal of excess animals from private lands.**

If the authorized officer determines that proper management requires the removal of wild horses and burros from areas that include private lands, the authorized officer shall obtain the written consent of the private owner before entering such lands. Flying aircraft over lands does not constitute entry.

#### **Subpart 4730—Destruction of Wild Horses or Burros and Disposal of Remains**

##### **§ 4730.1 Destruction.**

Except as an act of mercy, no wild horse or burro shall be destroyed without the authorization of the authorized officer. Old, sick, or lame animals shall be destroyed in the most humane manner possible. Excess animals for which adoption demand does not exist shall be destroyed in the most humane and cost efficient manner possible.

##### **§ 4730.2 Disposal of remains.**

Remains of wild horses or burros that die after capture shall be disposed of in accordance with State or local sanitation laws. No compensation of any kind shall be received by any agency or individual disposing of remains. The products of rendering are not considered remains.

#### **Subpart 4740—Motor Vehicles and Aircraft**

##### **§ 4740.1 Use of motor vehicles or aircraft.**

(a) Motor vehicles and aircraft may be used by the authorized officer in all phases of the administration of the Act, except that no motor vehicle or aircraft, other than helicopters, shall be used for the purpose of herding or chasing wild horses or burros for capture or

destruction. All such use shall be conducted in a humane manner.

(b) Before using helicopters or motor vehicles in the management of wild horses or burros, the authorized officer shall conduct a public hearing in the area where such use is to be made.

**§ 4740.2 Standards for vehicles used for transport of wild horses and burros.**

(a) Use of motor vehicles for transport of wild horses or burros shall be in accordance with appropriate local, State and Federal laws and regulations applicable to the humane transportation of horses and burros, and shall include, but not be limited to, the following standards:

(1) The interior of enclosures shall be free from protrusion that could injure animals;

(2) Equipment shall be in safe conditions and of sufficient strength to withstand the rigors of transportation;

(3) Enclosures shall have ample head room to allow animals to stand normally;

(4) Enclosures for transporting two or more animals shall have partitions to separate them by age and sex as deemed necessary by the authorized officer;

(5) Floors of enclosures shall be covered with nonskid material;

(6) Enclosures shall be adequately ventilated and offer sufficient protection to animals from inclement weather and temperature extremes; and

(7) Unless otherwise approved by the authorized officer, transportation shall be limited in sequence to a maximum of 24 hours followed by a minimum of 5 hours of on-the-ground rest with adequate feed and water.

(b) The authorized officer shall not load wild horses or burros if he/she determines that the vehicle to be used for transporting the wild horses or burros is not satisfactory for that purpose.

**Subpart 4750—Private Maintenance**

**§ 4750.1 Private maintenance.**

The authorized officer shall make available for private maintenance all healthy excess wild horses or burros for which an adoption demand by qualified individuals exists.

**§ 4750.2 Health, identification, and inspection requirements.**

**§ 4750.2-1 Health and identification requirements.**

(a) An individual determined to be qualified by the authorized officer shall verify each excess animal's soundness and good health, determine its age and sex, and administer immunizations,

worming compounds, and tests for communicable diseases.

(b) Documentation conforming compliance with State health inspection and immunization requirements for each wild horse or burro shall be provided to each adopter by the authorized officer.

(c) Each animal offered for private maintenance, including orphan and unweaned foals, shall be individually identified by the authorized officer with a permanent freeze mark of alpha numeric symbols on the left side of its neck. The freeze mark identifies the animal as Federal property subject to the provisions of the Act and these regulations by a patented symbol, the animal's year of birth, and its individual identification number. The authorized officer shall record the freeze mark on the documentation of health and immunizations. For purposes of this subpart, a freeze mark applied by the authorized officer is not considered a brand.

**§ 4750.2-2 Brand inspection.**

The authorized officer shall make arrangements on behalf of an adopter for State inspection of brands, where applicable, of each animal to be transported across the State where the adoption center is located. The adopter shall be responsible for obtaining inspections for brands required by other States to or through which the animal may be transported.

**§ 4750.3 Application requirements for private maintenance.**

**§ 4750.3-1 Application for private maintenance of wild horses and burros.**

An individual applying for a wild horse or burro shall file an application with the Bureau of Land Management on a form approved by the Director.

**§ 4750.3-2 Qualification standards for private maintenance.**

(a) To qualify to receive a wild horse or burro for private maintenance, an individual shall:

(1) Be 18 years of age or older;

(2) Have no prior conviction for inhumane treatment of animals or for violation of the Act or these regulations;

(3) Have adequate feed, water, and facilities to provide humane care to the number of animals requested. Facilities shall be in safe condition and of sufficient strength and design to contain the animals. The following standards apply:

(i) A minimum space of 144 square feet shall be provided for each animal maintained, if exercised daily; otherwise, a minimum of 400 square feet shall be provided for each animal;

(ii) Until fence broken, adult horses shall be maintained in an enclosure at least 6 feet high; burros in an enclosure at least 4½ feet high; and horses less than 18 months old in an enclosure at least 5 feet high. Materials shall be protrusion-free and shall not include large-mesh woven or barbed wire;

(iii) Shelter shall be available to mitigate the effects of inclement weather and temperature extremes. The authorized officer may require that the shelter be a structure, which shall be well-drained and adequately ventilated;

(iv) Feed and water shall be adequate to meet the nutritional requirements of the animals, based on their age, physiological condition and level of activity; and

(4) Have obtained no more than 4 wild horses and burros within the preceding 12-month period, unless specifically authorized in writing by the authorized officer.

(b) The authorized officer shall determine an individual's qualifications based upon information provided in the application form required by § 4750.3-1 of this subpart and Bureau of Land Management records of any previous private maintenance by the individual under the Act.

**§ 4750.3-3 Supporting information and certification for private maintenance of more than 4 wild horses or burros.**

(a) An individual applying for more than 4 wild horses or burros within a 12-month period, or an individual or group of individuals requesting to maintain more than 4 wild horses or burros at a single location shall provide a written report prepared by the authorized officer, or by a local humane official, veterinarian, cooperative extension agent, or similarly qualified person approved by the authorized officer, verifying that the applicant's facilities have been inspected appear adequate to care for the number of animals requested, and satisfy the requirements contained in § 4750.3-2(a).

(1) The report shall include a description of the facilities, including corral sizes, pasture size, and shelter, barn, or stall dimensions, and shall note any discrepancies between the facilities inspected and representations made in the application form.

(2) When an applicant requests 25 or more animals or when 25 or more animals will be maintained at any single location regardless of the number of applicants, the facilities for maintaining the adopted animals shall be inspected by the authorized officer prior to approving the application.

(b) Any individual or group represented by a power of attorney and applying for more than 4 animals shall provide the following:

- (1) A summary of the age, sex, and number of wild free-roaming horses or burros requested by species;
- (2) Requested adoption date and center location;
- (3) If applicable, names, addresses and telephone numbers of all applicants represented by a power of attorney submitted with the request;
- (4) A transportation plan that describes the transport vehicle and any rest-stops;
- (5) A distribution plan for delivering the animals to their assigned adopters;
- (6) Names, addresses, and a concise summary of the experience of the individuals who will handle the adopted animals during transportation and distribution; and
- (7) When the adopted animals will be maintained at a single location or where the applicants have been solicited by the holder of their power of attorney, a concise statement outlining the arrangements, including duties and responsibilities of the parties, for maintaining the animals.

#### § 4750.3-4 Approval or disapproval of applications.

If an application is approved, the authorized officer shall offer the individual an opportunity to select the appropriate number, sex, age and species of animals from those available. If the authorized officer disapproves an application for private maintenance because the applicant lacks adequate facilities or transport, the individual may correct the shortcoming and file a new application.

#### § 4750.4 Private maintenance of wild horses and burros.

##### § 4750.4-1 Private Maintenance and Care Agreement.

To obtain a wild horse or burro, a qualified applicant shall execute a Private Maintenance and Care Agreement and agree to abide by its terms and conditions, including but not limited to the following:

(a) Title to wild horses and burros covered by the agreement shall remain in the Federal Government for at least 1 year after the Private Maintenance and Care Agreement is executed and until a Certificate of Title is issued by the authorized officer.

(b) Wild horses and burros covered by the agreement shall not be transferred for more than 30 days to another location or to the care of another individual without the prior approval of the authorized officer;

(c) Wild horses and burros covered by the agreement shall be made available for physical inspection within 7 days of receipt of a written request by the authorized officer;

(d) The authorized officer shall be notified within 7 days of discovery of the death, theft or escape of wild horses and burros covered by the agreement;

(e) Adopters are financially responsible for the proper care and treatment of all wild horses and burros covered by the agreement.

(f) Adopters are responsible, as provided by State law, for any personal injury, property damage, or death caused by animals in their care; for pursuing animals that escape or stray; and for costs of recapture.

(g) Adopters shall notify the authorized officer within 30 days of any change in the adopter's address; and

(h) Adopters shall dispose of remains in accordance with applicable sanitation laws.

##### § 4750.4-2 Adoption fee.

(a) An individual obtaining wild horses and burros shall pay the Bureau of Land Management an adoption fee of \$125 per horse and \$75 per burro, except that no fee shall be paid for unweaned foals.

(b) The Director may adjust or waive the adoption fee on determining that wild horses or burros in the custody of the Bureau of Land Management are unadoptable when the full adoption fee is required, and that it is in the public interest to adjust or waive the adoption fee stated in paragraph (a) of this section. The adjustment or waiver shall extend only to those persons who are willing to maintain such animals privately, who demonstrate the ability to care for them properly, and who agree to comply with all rules and regulations relating to wild horses and burros.

##### § 4750.4-3 Request to terminate Private Maintenance and Care Agreement.

An adopter may request to terminate his/her responsibility for an adopted animal by submitting a written relinquishment of the Private Maintenance and Care Agreement for that animal. The authorized officer shall arrange to transfer the animal to another qualified applicant or take possession of the animal at a location specified by the authorized officer within 30 days of receipt of the written request for relinquishment.

##### § 4750.4-4 Replacement animals.

The authorized officer shall replace an animal, upon request by the adopter, if (a) within 6 months of the execution of the Private Maintenance and Care

Agreement the animal dies or is required to be destroyed due to a condition that existed at the time of placement with the adopter; and (b) the adopter provides, within a reasonable time, a statement by a veterinarian certifying that reasonable care and treatment would not have corrected the condition. Transportation of the replacement animal shall be the responsibility of the adopter.

#### 4750.5 Application for title to wild horses and burros.

(a) The adopter shall apply for title, using a form designated by the Director, upon signing the Private Maintenance and Care Agreement.

(b) The authorized officer shall issue a Certificate of Title after 12 months, if the adopter has complied with the terms and conditions of the agreement and the authorized officer determines, based either on a field inspection or a statement provided by the adopter from a veterinarian, extension agent, local humane official, or other individual acceptable to the authorized officer, that the animal or animals covered by the Agreement have received proper care and humane treatment.

(c) An adopter may not obtain title to more than 4 animals per 12-month period of private maintenance. Effective the date of issuance of the Certificate of Title, Federal ownership of the wild horse or burro ceases and the animal loses its status as a wild horse or burro and is no longer under the protection of the Act or regulations under this title.

#### Subpart 4760—Compliance

##### § 4760.1 Compliance with the Private Maintenance and Care Agreement.

(a) An adopter shall comply with the terms and conditions of the Private Maintenance and Care Agreement and these regulations. The authorized officer may verify compliance by visits to an adopter, physical inspections of the animals, and inspections of the facilities and conditions in which the animals are being maintained. The authorized officer may authorize a cooperative extension agent, local humane official or similarly qualified individual to verify compliance.

(b) The authorized officer shall verify compliance with the terms of the Private Maintenance and Care Agreement when an adopter has received 25 or more animals or when 25 or more animals are maintained at a single location.

(c) The authorized officer shall conduct an investigation when a complaint concerning the care, treatment, or use of a wild horse or

burro is received by the Bureau of Land Management.

(d) The authorized officer may require, as a condition for continuation of a Private Maintenance and Care Agreement, that an adopter take specific corrective actions if the authorized officer determines that an animal is not receiving proper care or is being maintained in unsatisfactory conditions. The adopter shall be given reasonable time to complete the required corrective actions.

#### **Subpart 4770—Prohibited Acts, Administrative Remedies, and Penalties**

##### **§ 4770.1 Prohibited acts.**

The following acts are prohibited:

- (a) Maliciously or negligently in juring or harassing a wild horse or burro;
- (b) Removing or attempting to remove a wild horse or burro from the public lands without authorization from the authorized officer;
- (c) Destroying a wild horse or burro without authorization from the authorized officer except as an act of mercy;
- (d) Selling or attempting to sell, directly or indirectly, a wild horse or burro or its remains;
- (e) Commercially exploiting a wild horse or burro;

(f) Treating a wild horse or burro inhumanely;

(g) Violating a term or condition of the Private Maintenance and Care Agreement;

(h) Branding a wild horse or burro;

(i) Removing or altering a freeze mark on a wild horse or burro;

(j) Violating an order, term, or condition established by the authorized officer under this part.

##### **§ 4770.2 Civil penalties.**

(a) A permittee or lessee who has been convicted of any of the prohibited acts found in § 4770.1 of this title may be subject to suspension or cancellation of the permit or lease.

(b) An adopter's failure to comply with the terms and conditions of the Private Maintenance and Care Agreement may result in the cancellation of the agreement, repossession of wild horses and burros included in the agreement and disapproval of requests by the adopted for additional excess wild horses and burros.

##### **§ 4770.3 Administrative remedies.**

Any person who is adversely affected by a decision of the authorized officer in the administration of these regulations may file an appeal in accordance with 43 CFR 4.4 within 30 days of receipt of the written decision.

##### **§ 4770.4 Arrest.**

The Director of the Bureau of Land Management may authorize an employee who witnesses a violation of the Act or these regulations to arrest without warrant any person committing the violation, and to take the person immediately for examination or trial before an officer or court of competent jurisdiction. Any employee so authorized shall have power to execute any warrant or other process issued by an officer or court of competent jurisdiction to enforce the provisions of the Act or these regulations.

##### **§ 4770.5 Criminal penalties.**

Any person who commits any act prohibited in § 4770.1 of these regulations shall be subject to a fine of not more than \$2,000 or imprisonment for not more than 1 year, or both, for each violation. Any person so charged with such violation by the authorized officer may be tried and sentenced by a United States Commissioner or magistrate, designated for that purpose by the court by which he/she was appointed, in the same manner and subject to the same conditions as provided in 18 U.S.C. 3401.

[FR Doc. 86-4532 Filed 2-28-86; 8:45 am]

BILLING CODE 4310-84-M

## **Exhibit D**

Copy of 56 Fed. Reg. 786, dated January 9, 1991

## **56 FR 786**

January 9, 1991

Rules and Regulations

### **Reporter**

56 FR 786

***Federal Register > 1991 > January > January 9, 1991 > Rules and Regulations > FEDERAL REGISTER***

**Title:** Protection, Management, and Control of Wild Free-Roaming Horses and Burros; Prohibited Acts, Administrative Remedies, and Penalties; Administrative Remedies

**Action:** Interim final rule and request for comments.

### **Agency**

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FEDERAL REGISTER

**Identifier:** [AA-250-00-4370-02; Circular No. 2631] > RIN 1004-AB81

### **Administrative Code Citation**

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43 CFR Part 4700

### **Synopsis**

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**SUMMARY:** This interim final rule allows the authorized officer to place in full force and effect decisions to cancel a Private Maintenance and Care Agreement (PMACA) in situations where wild horses or burros subject to such an agreement are found to be abused or mistreated.

**52DATE:** *Effective date:* January 9, 1991. Comments on the interim final rule should be received on or before March 11, 1991. Comments received or postmarked after the above date may not be considered in the decisionmaking process on the final rule.

### **Text**

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**SUPPLEMENTARY INFORMATION:** In accordance with [43 CFR 4770.3](#), "Any person who is adversely affected by a decision of the authorized officer \* \* \* may file an appeal \* \* \* " Under the regulations of the Bureau of Land Management (BLM) implementing the Administrative Procedure Act, most appealed decisions are stayed pending resolution of the appeal by the Interior Board of Land Appeals (IBLA). The existing rules delay wild horse and burro repossession decisions for up to 2 years pending the IBLA rulings.

The present regulations provide no means for immediate cancellation of a PMACA and repossession of adopted animals when an adopter's abuse or negligence threatens the welfare of a wild horse or burro. The BLM continues to have several cases every year that require immediate removal of an animal from an adopter to prevent severe or

56 FR 786

long-term damage to the animal's health. The health and welfare of these animals will be benefitted by implementation of this rule upon publication.

The principal author of this interim final rule is Vernon R. Schulze, wild horse and burro program specialist, assisted by the staff of the Division of Legislation and Regulatory Management, BLM.

It has been determined that this rule does not constitute a major Federal action significantly affecting the quality of the human environment and that no detailed statement pursuant to section 102(2)(C) of the National Environmental Policy Act of 1969 ([42 U.S.C. 4332\(2\)\(C\)](#)) is required.

The Department of the Interior has determined under Executive Order 12291 that this document is not a major rule, and under the Regulatory Flexibility Act ([5 U.S.C. 601](#) et seq.) that it will not have significant economic impact on a substantial number of small entities. Additionally, as required by Executive Order 12630, the Department has determined that the rule would not cause a taking of private property.

This rule does not contain information collection requirements that require approval by the Office of Management and Budget under [44 U.S.C. 3501](#) et seq. However, an additional paragraph has been added to the Note at the beginning of Group 4700 describing the information collection burden imposed by other regulations in the Group, as required by the Departmental Manual of the Department of the Interior. This Note has no relation to the substantive provisions of this rule.

## Regulations

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List of Subjects in 43 CFR Part 4700

Advisory committees, Aircraft, Intergovernmental relations, Penalties, Public lands, Range management, Wild horses and burros, Wildlife.

Under the authorities cited below, part 4700, subchapter D, chapter II, title 43 of the Code of Federal Regulations is amended as set forth below.

### **PART 4700 -- PROTECTION, MANAGEMENT, AND CONTROL OF WILD FREE-ROAMING HORSES AND BURROS**

1. The authority citation for part 4700 continues to read as follows:

**Authority:** Act of Dec. 15, 1971, as amended ([16 U.S.C. 1331-1340](#)), Act of Oct. 21, 1976 ([43 U.S.C. 1701](#) et seq.), Act of Sept. 8, 1959 ([18 U.S.C. 47](#)), Act of June 28, 1934 ([43 U.S.C. 315](#)).

2. The Note at the beginning of Group 4700 is amended by adding a new paragraph at the end thereof to read as follows:

\* \* \* \* \*

Public reporting burden for this information is estimated to average 0.165 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Information Collection Clearance Officer, Division of Information Resources Management, Bureau of Land Management (770), 1849 C Street NW., Washington, DC 20240, and the Office of Management and Budget, Paperwork Reduction Project 1004-0042, Washington, DC 20503.

3. Section 4770.3 is revised to read as follows:

#### **§ 4770.3 Administrative remedies.**

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- (a) Any person who is adversely affected by a decision of the authorized officer in the administration of these regulations may file an appeal. Appeals must be filed within 30 days of receipt of the decision in accordance with 43 CFR part 4, subpart E.
- (b) The authorized officer may place in full force and effect decisions to cancel a Private Maintenance and Care Agreement so as to allow repossession of wild horses or burros from adopters to protect the animals' welfare. Appeals and petitions for stay of decisions shall be filed with the Interior Board of Land Appeals as specified in this part.

Dated: November 7, 1990.

Dave O'Neal,

Assistant Secretary of the Interior.

[FR Doc. 91-438 Filed 1-8-91; 8:45 am]

BILLING CODE 4310-84-M

## Contacts

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ADDRESSES: Comments should be sent to: Director (140), Bureau of Land Management, U.S. Department of the Interior, room 5555, 1849 C St. NW., Washington, DC 20240.

Comments will be available for public review in room 5555 of the above address during regular business hours (7:45 a.m. to 4:15 p.m.), Monday through Friday.

FOR FURTHER INFORMATION CONTACT: John S. Boyles, Chief, Division of Wild Horses and Burros, at the Bureau of Land Management (250), Premier Building, room 901, U.S. Department of the Interior, 1849 C St. NW., Washington, DC 20240: Telephone (202) 653-9215.

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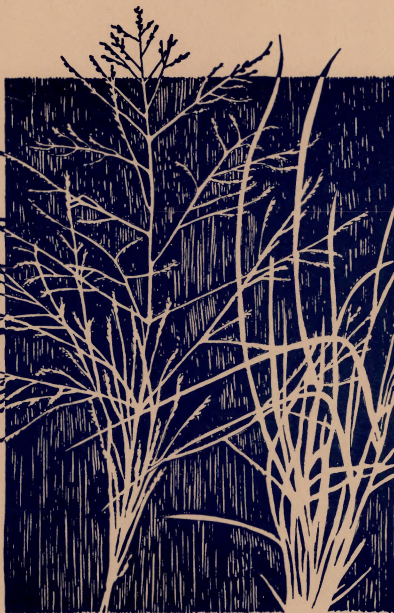
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## **Exhibit E**

Copy of Bureau Technical Guide 4400-1

# RANGELAND MONITORING



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## Planning for Monitoring



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UNITED STATES

DEPARTMENT OF THE INTERIOR

BUREAU OF LAND MANAGEMENT

# RANGELAND MONITORING

## PLANNING FOR MONITORING

TECHNICAL REFERENCE 4400-1

APRIL 1984

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Bureau of Land Management  
1000  
Box 50 Denver Federal Center  
Denver, CO 80225

UNITED STATES

DEPARTMENT OF THE INTERIOR

BUREAU OF LAND MANAGEMENT

RANGELAND MONITORING

PLANNING FOR MONITORING

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## RANGELAND MONITORING - PLANNING FOR MONITORING

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## RANGELAND MONITORING - PLANNING FOR MONITORING

1. IDENTIFYING NEED FOR MONITORING.

Monitoring studies should be conducted at a level consistent with identified need. The basic need for rangeland monitoring in the Bureau of Land Management (BLM) is identified by the objectives which originate in land-use plans and are established in final decisions made by the authorized officer. Management objectives from land use, coordinated resource management, and activity plans establish a framework and criteria for determining the level of intensity and reliability desired for monitoring. In general, areas with significant resource conflicts, controversy, or potential for improvement may require more intensive monitoring. In many instances, it may be necessary to weigh monitoring needs against the requirement for a cost- and time-efficient monitoring program within funding and personnel constraints.

2. COORDINATION.

2.1 Coordinating Inventory and Monitoring. Inventory and monitoring programs should be coordinated within an area to provide for the most efficient collection of the data needed and to ensure the greatest utility of the data. Inventory and monitoring data collected on an area should be complementary.

2.11 Inventory as a Basis for Monitoring. Baseline inventory data needed to establish a basis for a rangeland monitoring program consist of an Order 3 soil survey, mapping of vegetation types and range sites, and other renewable resource information. These baseline or basic resource data include: the description, classification, productivity, properties, and mapping of kinds of soil; range site descriptions; site potential; and present vegetation. The vegetation inventory should provide sufficient production data to make a reasonable estimate of the current ecological status. These data provide a base for stratifying allotments, wildlife habitat areas, herd management areas, watershed areas, or other designated management areas. (See Section 5.11.) Where baseline inventory data are not available, existing data should be used as a basis for a monitoring program.

2.12 Using Inventory Methods for Monitoring. Methods for collecting inventory data may be used for monitoring studies. Where inventories have been completed, existing inventory data may be the starting point for monitoring. Where inventories are scheduled, plan for the collection of data needed to initiate monitoring or to complement monitoring data already being collected.

## Section 2.2

## RANGELAND MONITORING - PLANNING FOR MONITORING

2.2 Interdisciplinary Coordination. Monitoring programs should be coordinated closely to ensure all facets of multiple-use management are considered. This prevents duplication of effort and ensures a free flow of information among resource programs. Coordinated monitoring plans provide for integrated data collection necessary to assess the effectiveness of on-the-ground management actions and to determine progress in resolving resource problems and conflicts and meeting management objectives. The interdisciplinary coordination efforts should be documented. If specific monitoring studies are needed for program management (e.g. wildlife, forestry, wild horses, and wild burros) they should be established by those programs.

2.3 Inter-Area/District/State Coordination. Ongoing and future monitoring programs should be coordinated with adjoining areas, Districts, and States. This coordination should address the similarities and differences between the programs with regard to study methods, training, studies schedules, consultation, cooperation, coordination with rangeland users and other interested parties, and the evaluation format and schedule. Coordination facilitates the common evaluation of resource management action and minimizes misunderstanding among affected and interested parties.

2.4 Consultation, Cooperation, and Coordination. Monitoring programs should include appropriate consultation, cooperation, and coordination with the rangeland users, general public, advisory boards and councils, landowners, extension service, academia, private organizations, and local, State, and Federal agencies as monitoring plans are prepared, administered, and revised. The credibility of the monitoring program is enhanced by direct involvement by users and other interested parties in preparation of monitoring plans, collection of studies data, and in subsequent evaluations based on these data. Measures should be taken, as appropriate, (field days, meetings, etc.) to ensure active and meaningful participation by affected and interested parties. All consultation, cooperation, and coordination should be documented.

## RANGELAND MONITORING - PLANNING FOR MONITORING

3. PRIORITY.

The BLM cannot intensively monitor the effectiveness of on-the-ground management actions on all the rangelands it administers because of funding and personnel constraints. Therefore, priorities concerning monitoring needs should be assigned by allotment, wildlife habitat area, herd management area, watershed area, or other designated management area. Following is a list of criteria that can be used, as appropriate, in assigning priorities.

- Land-use plan objectives (such as those for the three categories of allotments--maintain, improve, and custodial).
- Coordinated resource management plan objectives.
- Activity plan objectives.
- Intensity of planned management efforts.
- Current productivity.
- Current resource values.
- Current ecological status.
- Resource conflicts/controversy (known and anticipated).
- Significance of unresolved issues.
- Present and future management.
- Known or anticipated changes in grazing management.
- Potential for improvement.
- Potential for economic return on investment.
- Socio-economic situations.
- Special/unique situations (example: crucial habitat).
- Threatened, endangered, or sensitive species habitat.
- Status of range improvements (lacking, adequacy, maintenance).

## Section 4

## RANGELAND MONITORING - PLANNING FOR MONITORING

4. TRAINING.

The objective of monitoring training is to provide consistency and reliability in collecting and evaluating data. Examiners collecting data should have a basic understanding of the entire data collection, analysis, evaluation, and decisionmaking process. Such an understanding promotes a greater appreciation for the emphasis on uniformity, accuracy, and reliability of monitoring studies data and for decisions based on these data. Examiners should understand why they are collecting the data and how the data will be used.

4.1 Beginning-of-Field Season Training. Training should be provided annually at the beginning of the field season for all examiners involved in collecting studies data. Annual training applies not only to initial training for new and/or inexperienced examiners but also to review and recalibration training for experienced examiners.

4.11 Training Location. Training should take place in the field to ensure that the detailed procedural instructions relate directly to the rangelands of concern.

4.12 Equipment and Supplies. Examiners should be familiar with the equipment and supplies used to collect the data, including forms, frames, and cameras.

4.13 Studies Location and Data Documentation. Examiners should be familiar with and understand the studies documentation procedure prescribed by the authorized officer. As a follow-up to training, study data collected in any one year should be checked to see that the desired data have been collected and properly recorded.

4.14 Instructors. Training should be conducted by qualified BLM personnel with assistance from outside the BLM, as appropriate.

4.2 Training During Field Season. Periodic review and/or recalibration during the field season may also be necessary to maintain consistency among examiners and to account for phenological changes. Review and recalibration is especially important where study methods require estimates rather than measurements for collecting data.

## RANGELAND MONITORING - PLANNING FOR MONITORING

5. SAMPLING.

In the study of rangelands it is impossible to measure or count everything. Therefore, samples are taken on part of the population under study and conclusions about the characteristics of the population are drawn from characteristics of the samples. Sampling should be appropriate to the identified need based on established objectives for the area. The number of samples needed to achieve the desired confidence level and precision should be determined. Time and cost per sample will influence the number of samples that can be collected.

5.1 Intensity of Sampling. Factors to be considered in determining the intensity of sampling are: complexity or sensitivity of known or anticipated resource use conflicts or controversy, intensity of on-the-ground management, diversity of vegetation types, present ecological status, trend, and the desired level of precision. Intensity of sampling is dependent on the kind, quality, and quantity of data needed at each site. The stratification, key area, and key species concepts can be used, as appropriate, in selecting study sites where data will be collected. Stratification and selection of key areas are critical and if not done properly can ultimately lead to the failure of a monitoring program. In determining the intensity of sampling, the authorized officer should weigh the desired level of monitoring against funding and personnel capabilities. Professional judgment plays a major role in making these determinations.

5.11 Stratification. Stratification is a means of dividing an area of rangeland into smaller, more homogeneous units. Thus, allotments, pastures, wildlife habitat areas, herd management areas, watershed areas, or other designated management areas may be divided into areas having similar characteristics. Strata may be pastures within an allotment subjected to similar grazing uses, or areas having similar vegetation, comparable soils, or uniform topography. Stratification should be done by a person who is knowledgeable of the area. Multiple-use coordination and participation by interested parties should be solicited in completing the stratification of any rangeland area. (See Sections 2.2 and 2.4.)

a. Size of Strata. Strata may be any size depending on the intensity or detail of the stratification. Good maps and aerial photographs are essential in mapping strata.

b. Criteria for Stratification. Following are some criteria that can be considered in stratification:

(1) Vegetation Type. Existing plant communities are primary criteria for stratifying rangelands. Each major vegetation type may be a stratum.

(2) Range Sites. Range sites with their specific plant associations and specific physical site characteristics may be used as criteria for stratifying rangelands. Each range site may be a stratum.

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## Section 5.11b(3)

## RANGELAND MONITORING - PLANNING FOR MONITORING

(3) Present Ecological Status. Present ecological status of the range sites, or portions of range sites, may be used as a basis for stratification.

(4) Soils and Topography. Soil, topographic, and environmental differences are usually expressed in the vegetation type. However, in some cases, soil and topography may be more significant than vegetation in stratifying such areas as fragile watershed, critical areas, etc.

(5) Grazing Systems. Areas subjected to similar grazing treatment under implemented grazing systems may be considered in stratification.

(6) Utilization Patterns. Grazing utilization patterns (use zones) are often well defined. These patterns can play a key role in stratifying rangelands as well as in locating key areas. (See Section 4, Technical Reference 4400-3.)

(7) Critical Areas. Each critical area may be considered as a separate stratum. If necessary, large critical areas may be further stratified using other criteria.

(8) Range Readiness. Under certain grazing systems, rangeland readiness may be an important stratification consideration. Stratification may be based on seasonal use areas such as spring rangeland, summer rangeland, etc.

(9) Suitability. Although topography may be used as a separate criterion for stratification, suitability of rangelands for use by different grazing animals can also be used in stratifying these lands.

(10) Threatened, Endangered, and Sensitive Species Habitat. In some cases, habitat for threatened, endangered, and sensitive plant and animal species may be an important consideration in stratifying an area.

5.12 Key Areas. Key areas are indicator areas that have the capability to reflect what is happening on the strata they represent as a result of on-the-ground management actions. Depending on the management objectives, a key area may be a representative sample of a large stratum, such as a pasture, allotment, etc., or it may be a representative sample of a small stratum having important grazing value, such as a heavy use area near water, a riparian zone, etc. A key area could also be a representative sample of a sensitive or critical area, such as a fragile watershed, sage grouse nesting ground, etc. Key areas may represent the "pulse" of the rangeland (pasture, allotment, wildlife habitat area, herd management area, watershed area, etc.) or they may represent only specific areas. Monitoring studies are located within key areas.

## RANGELAND MONITORING - PLANNING FOR MONITORING

a. Selecting Key Areas. Selection of key areas is tied directly to land use, coordinated resource management, and/or activity plan objectives. Proper selection of key areas is critical to the success of a monitoring program. Where justified, an interdisciplinary team may be used to select these areas. In addition, permittees, lessees, and other interested parties outside the BLM may be invited to participate, as appropriate, in the selection of key areas. (See Sections 2.2 and 2.4.) Poor information resulting from improper selection of key areas can result in misguided decisions and improper management. Some of the site characteristics and other information that may be considered in the selection of key areas are:

- (1) Soil.
- (2) Vegetation (kinds and distribution of plants).
- (3) Range sites.
- (4) Ecological status.
- (5) Topography.
- (6) Location of water, fences, and natural barriers.
- (7) Size of pasture.
- (8) Kind and/or class of foraging animals - livestock, wildlife, wild horses, wild burros.
- (9) Habits of the animals, including foraging.
- (10) Areas of animal concentration.
- (11) Location and extent of critical areas.
- (12) Erosion conditions.
- (13) Threatened, endangered, and sensitive species - both plant and animal.
- (14) Periods of animal use.
- (15) Grazing history.
- (16) Location of salt, mineral, and protein supplements.
- (17) Location of livestock, wildlife, wild horse, and/or wild burro trails.

## Section 5.12b

## RANGELAND MONITORING - PLANNING FOR MONITORING

b. Criteria for Selecting Key Areas. Following are some criteria that should be considered in selecting key areas. A key area:

- (1) Should be representative of the stratum in which it is located.
- (2) Should be located within a single range site and present plant community.
- (3) Should contain the key species or have the potential to produce the key species.
- (4) Should be foraged by livestock, wildlife, wild horses, and/or wild burros when the pasture, allotment, etc., is used.
- (5) Should be capable of and likely to show response to management actions. This response should be indicative of the response that is occurring on the stratum.
- (6) May be selected to represent special or unique situations such as a riparian zone, fragile watershed, heavily grazed area, or crucial or important area.

c. Number of Key Areas. The number of key areas which are selected to represent a stratum depends on the size of the stratum and on data needs but may ultimately be limited by funding and personnel constraints. If stratification is appropriate, one key area in each stratum may be adequate. Additional key areas may be selected, as appropriate.

d. Mapping Key Areas. Key areas should be accurately delineated on aerial photos and/or maps. Mapping key areas will provide a permanent record of their location. (See Section 6.)

5.13 Key Species. Key species are generally an important component of a plant community. Key species serve as indicators of change and may or may not be forage species. More than one key species may be selected for a stratum depending on management objectives and data needs. In some cases, problem plants (poisonous, etc.) may be selected as key species.

a. Selecting Key Species. Selection of key species should be tied directly to management objectives in land-use, coordinated resource management, and activity plans. This selection is dependent upon the plant species in the present community, the present ecological status, and the potential natural community for the specific sites. Selection of key species may be guided by the objective of reestablishing a desirable species within a plant community. An interdisciplinary team should be used, as appropriate, in selecting key species to ensure that data needs of the various resources are met. In addition, interested parties outside the BLM are invited to participate, as appropriate, in selecting these species. (See Sections 2.2 and 2.4.)

## RANGELAND MONITORING - PLANNING FOR MONITORING

b. Considerations in Selecting Key Species. The following points should be considered in selecting key species:

(1) The foraging use of the key species on key areas is assumed to reflect foraging use on the entire stratum.

(2) Changes in density, frequency, reproduction, etc., of key species on key areas are assumed to reflect changes in these species on the entire stratum.

(3) A key species is often relatively abundant and tolerant to moderate grazing.

(4) Depending on the selected management and/or periods of use, key species may be foraged during the growing period, after maturity, or both.

(5) Overuse of a key species can have a significant effect on wildlife, wild horse, or wild burro habitat, watershed condition, grazing capacity, scenic value, water quality, or other resource values.

(6) The forage value of key species may be of secondary or no importance. For example, watershed protection may require selection of plants as key species which protect the watershed but are not the best forage species. In some cases, threatened, endangered, or sensitive species which have no particular forage value may be selected as key species.

(7) In areas of yearlong grazing use and in areas where there is more than one use period, several key species may be selected to determine utilization. For example, on an area with both winter and summer grazing use, a cool season plant may be the key species during the winter and a warm season plant may be the key species during the summer.

(8) Selection of several key species may be desirable when adjustments in livestock grazing use are anticipated.

(9) If the objective is to maintain an advanced seral community, the key species should be a major component of that community.

c. Key Species on Depleted Rangelands. The key species selected should be present, or potentially so, on each key area on which monitoring studies are conducted; however, on depleted rangelands these species may be sparse or absent.

## Section 5.13c(1)

## RANGELAND MONITORING - PLANNING FOR MONITORING

(1) Key Species Sparse. Plants of the key species may be so sparse that they are found only on protected sites. When this is true, determine whether the greatest benefit can be achieved by improving and perpetuating or by sacrificing these species. If the species are the best plants for the area and their restoration is economically feasible, management should be based on increasing these species until they are a major component of the plant community. This may involve a severe change in grazing intensity and/or period(s) of use.

(2) Key Species Absent. If a key area does not include any plants of the key species because of severe depletion, it may be necessary to conduct monitoring studies on other species that comprise the bulk of the forage. Data gathered on non-key species must be interpreted on the basis of effects on the establishment and subsequent response of the key species. If the key species does not respond favorably to the selected management system and does not appear on the key area within a reasonable length of time, the reason for its absence might be determined by analysis of data gathered on other forage species. For example, a high percent utilization on non-key species during the critical growth period of the key species may reflect a high utilization on young plants of the key species, thereby curtailing their establishment. Conversely, heavy use during a critical growth period of non-key species may eliminate the competition and provide a desirable environment for accelerated reestablishment of the key species.

5.2 Selecting Sampling Methods and Sampling Designs. There are a variety of sampling methods and sampling designs that can be used to collect data to monitor the effectiveness of on-the-ground management actions and to evaluate progress toward meeting management objectives.

5.21 Basic Sampling Methodologies. Technical References 4400-2, 3, and 4 describe some basic actual use, utilization, and trend study methods. As monitoring plans are developed, methods should be selected which will provide the needed data. Care must be exercised in the selection of monitoring study methods to ensure that they are suitable for the vegetation types and resource conditions that will be encountered. The capability of the study methods to detect subtle changes due to management over short periods of time should be carefully considered.

5.22 Other Sampling Methodologies. Variations from the methods or combinations of methods described in Technical References 4400-2, 3, and 4 should be thoroughly described in monitoring plans. Variations and/or combinations should receive a thorough review as they are developed and adopted.

5.23 Sampling Designs. The format for the analysis of study data is dependent on the kind of data collected, study layout, and the number of transects/plots. (See Section 5.4.) The following factors should be considered in selecting a sampling design.

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a. Use of several short transects may be more advantageous than one long transect.

b. Randomization at some stage in a sampling design is advised for most statistical tests to be valid. Randomization allows for an unbiased estimate of error and permits establishment of confidence limits.

c. Every effort should be made to minimize bias and error and to increase precision. Precision can be increased by reducing internal variation and increasing sample size.

5.3 Changes in Sampling. For monitoring study data to be meaningful and useful over time, there must be consistency in the kinds of data that are collected and the manner in which they are collected. However, the need for changes in sampling may occasionally arise when problems are detected during a cursory review of the collected data, when analyzing and interpreting the data, or when conducting an evaluation. If problems occur, certain factors, such as stratification, location of key areas, key species, study methods, examiners, training, and time of year of data collection, should be reexamined. In some cases, problems can be corrected without making significant changes; on the other hand, there may be instances where substantial changes are needed. Serious consideration must be given to the effect changes will have on the historical value of existing data. Will changes mean starting all over again or will they complement existing studies data?

5.31 Changing Stratification/Key Areas. Changes in stratification and location of key areas may sometimes be necessary. Such changes are warranted if key areas are improperly located or changes occur in management and grazing use patterns. The consequences of changing stratification and key areas should be carefully considered.

5.32 Changing Sampling Methods. Sampling methods should not be changed without justification. Changes should be made only after an evaluation of the data shows that the existing sampling method is not providing the desired data. All changes in sampling methods should be documented and approved.

5.33 Changing Sampling Design. Changing parts of the sampling design, such as number of samples, sampling interval, frame size, length of transect, etc., should be carefully evaluated. Changes should be made only after determining that the present sampling design is not providing the desired data. All changes in sampling design should be thoroughly documented and approved.

## Section 5.4

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5.4 Sampling Precision and Accuracy. Under a monitoring program, measurements, estimates, and/or other observations are obtained by sampling vegetation attributes within a key area. Sampling designs may be based on statistical considerations such as random and unbiased sampling. The proper use of statistical methods allows probabilistic statements to be made about the measurements, estimates, and/or observations obtained. If statistical methods will be an integral part of sampling and analysis, sampling design and intensity can be tailored to provide the needed data. It is important to be able to determine the precision and accuracy of the samples taken. This does not mean that in all cases a fixed probability level must be achieved (i.e., 80 percent  $\pm$  20 percent). Suggested references are Barrett and Nutt (1979), Freese (1962, 1967), and Zar (1974). The timely discussion found in McQuisten and Gebhardt (1983) is also recommended reading. (See BIBLIOGRAPHY.)

6. RETAINING MONITORING STUDIES DATA.

A significant amount of funding and manpower have been expended and will be expended in the future for collecting monitoring study data. Each field office should have a plan for filing, storing, and retaining the data which have been collected. In addition, the plan should provide for recording the location and description of the specific study sites. Monitoring study data collected over a period of years will be important to resource management in the future. Even where studies are discontinued, the data and the record of study locations should be retained.

7. MONITORING PLANS.

Monitoring plans are prepared to provide for the orderly and periodic collection of study data needed to make management decisions, determine the effectiveness of on-the-ground management actions, and evaluate progress toward meeting management objectives. Monitoring plans should provide for proper stratification, correct implementation of selected study methods, adequate sampling, and logical analysis, interpretation, and evaluation of data. The rationale/justification for selecting the particular course of action with respect to these items should be documented in the plans. These plans should be prepared in careful and considered consultation with all affected parties and interests both within and outside the BLM.

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7.1 Identifying Areas to be Covered by Monitoring Plans. The authorized officer should determine the most appropriate area to be covered by a monitoring plan. This area may be a Resource Area, the area covered by a resource management plan/environmental impact statement, a coordinated resource management plan, an activity plan, or other area, as specified.

7.2 Essential Components of Monitoring Plans. The basic components of a monitoring plan are:

- What data need to be collected.
- How the data will be collected.
- Why the specific sampling methods were selected to collect the data.
- Where studies will generally be located.
- Where data will be filed and stored.
- When studies will be established, read, and evaluated (schedules).
- Who (which position) has responsibility for collecting data, providing training, providing quality control, evaluating studies and other data, and administering the monitoring program to see that it is carried out as planned. The plan should identify non-BLM people who may have accepted responsibilities relative to the monitoring plan.

7.3 Preparing Monitoring Plans. The following guidance can be used in preparing monitoring plans which will encourage an orderly and comprehensive approach to resource monitoring. While this guidance is not intended to be all inclusive, it covers many of the essential elements that should be considered in preparing monitoring plans. If any of the elements are described elsewhere, such as in land-use, coordinated resource management, and activity plans or other documents, cross reference the appropriate document; do not duplicate information available in other documents. The plans should be tailored to fit the needs of the areas covered by the plans.

7.31 Interdisciplinary, Public, and Other Coordination. Measures should be taken to encourage appropriate interdisciplinary participation; general public, academic, extension service, and user involvement; and inter-area/District/State coordination in the preparation of monitoring plans. (See Sections 2.2 through 2.4.) Monitoring plans should explain both the coordination that has occurred and the coordination that is planned for the future.

7.32 Description of Area Covered by Plan. The area covered by a monitoring plan should be briefly described. The description should include general geographical, physical, and biotic characteristics of the area.

7.33 Management Objectives and Monitoring Priority.

a. Management Objectives. Management objectives are planned results for allotments, wildlife habitat areas, herd management areas, watershed areas, or other designated management areas. Objectives should relate to resource attributes that can be monitored and that are sensitive indicators of change. Objectives should:

## Section 7.33a

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- be simple and understandable,
- be measurable and quantifiable,
- be realistic, and
- have time periods for completion.

(1) Management objectives may be of a general nature until the initial data have been collected, after which, the objectives may be refined. Objectives may need to be modified from time to time based on the accession of data which supplement previously existing data.

(2) Management objectives are categorized as short-term objectives or long-term objectives. In particular, objectives relating to utilization tend to be short-term in nature, while objectives relating to trend in ecological status or resource value rating tend to be long-term.

b. Monitoring Priority. A priority concerning monitoring needs should be assigned to each allotment, wildlife habitat area, herd management area, watershed area, or other designated management areas. Where planning was completed without assigning management priorities among allotments or groups of allotments under the selective management approach, categorizing allotments (maintain, improve, custodial) when monitoring plans are prepared may help to establish the priority for monitoring on an allotment basis. (See Section 3.)

#### 7.34 Study Methods to be Used.

a. Existing Studies. Study methods used for previously established studies should be described in detail, or a reference should be made to an existing description in a technical reference or publication, another monitoring plan, or other document. If reference is made to an existing description, any variations from that description should be explained.

(1) Ground Rules. Any "ground rules" unique to the area covered by a monitoring plan should be explained. These "ground rules" may address such things as: differentiating between dead and live portions of sod-forming plants, determining what constitutes a plant for rhizomatous and sod-forming plants, and how annuals will be considered in the studies.

(2) Continuing Existing Studies. The monitoring plan should include a brief explanation of how data collected with existing study methods will or will not satisfy identified monitoring needs. The rationale/justification for continuing to use existing study methods should be documented. (See Section 5.2.)

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(3) Discontinuing Existing Studies. Rationale for discontinuing existing study methods should be included in the monitoring plan. (See Section 5.3.)

(4) Retaining Data from Discontinued Studies. Provisions to retain data from discontinued studies should be explained. (See Section 6.)

b. New Studies. Study methods that will be used for new studies should be described in detail, or a reference should be made to an existing description in a technical reference or publication, another monitoring plan, or other document. If reference is made to an existing description, any variations from that description should be explained. Specific details that may be described are: minimum number of samples, size of frame(s), interval between samples, and how many plants will be sampled for utilization. Explain the "ground rules" as they apply to the study methods. (See Section 7.34a(1).) Rationale/justification for using the selected study methods should be documented. (See Section 5.2.)

### 7.35 Studies Location and Data.

a. Studies by Management Area. All studies which will be conducted on each allotment, wildlife habitat area, herd management area, watershed area, or other designated management area should be listed. The amount of detail necessary will vary from area to area. In some cases a brief list of studies may suffice, while in other cases, descriptions of study locations may be necessary. Where appropriate, any statistical considerations such as number of samples and desired confidence levels should be described. (See Section 5.4.)

b. Study Sites. Any special or unique criteria that will be used in the selection of key areas and/or key species should be explained. Rationale/justification for selecting study sites should be documented. In some cases, consideration may be given to locating study sites where studies will provide data concerning the effects of continuing the existing management actions as well as the effects of newly implemented or future management actions.

c. Data Records and Storage. The plan should explain how and where data are to be recorded, filed, and stored. It should discuss any computer capability that may be used. The disposition of field data forms and provisions for permanent storage of data should be documented. (See Section 6.)

## Section 7.35d

## RANGELAND MONITORING - PLANNING FOR MONITORING

d. Marking Study Site Locations. Every effort should be made to establish uniformity in marking study locations in the field and in documenting study locations in the office. Locating established study sites is often very time-consuming and good location documentation can greatly decrease the time spent in this effort.

e. Photographic Records. The plan should describe the extent to which photographs will be used, taking into consideration such items as prints vs. slides, color vs. black and white film, close-up and general view photographs, and the direction from which photographs should be taken. It should explain how photographs will be stored as part of the permanent monitoring records. (See Section 6.)

### 7.36 Studies Schedule.

a. Establishing and Reading Studies. A study schedule should specify when studies are to be established and read. The monitoring plan should identify the position(s) responsible for these tasks. The plan should also identify parties outside the BLM who have accepted responsibility for collecting studies data.

b. Priority for Conducting Studies. Where unforeseen circumstances prevent completion of planned work, refer to the priority list in the monitoring plan. This list indicates the order in which studies should be completed by allotment, wildlife habitat area, herd management area, watershed area, or other designated management area. In situations where all the work cannot be completed, the studies that are established and/or read, should be done to the standard called for in the monitoring plan. It is not advisable to try to complete all the scheduled work, if part or all of it has to be done below standard.

c. Progress Reporting. Study schedules can be used as records of accomplished and unfinished work. Schedules can prevent some studies from being inadvertently overlooked.

d. Workload. Studies schedules reflect the monitoring program workload for Resource Areas and are useful in preparing annual work plans. These schedules, along with other elements in monitoring plans, are valuable in preparing requests for the funding and manpower needed to accomplish the desired level of monitoring.

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**7.37 Analysis, Interpretation, and Evaluation.** The monitoring plan should include a discussion of data analysis, interpretation, and evaluation, and should identify any computer programs or programs for programmable calculators that will be used. The plan should describe other data that may be used in the evaluation, including data collected by non-BLM parties. Provisions may also be made for any desired peer review of the analysis, interpretation, and evaluation. The plan may identify the format to be used for presenting results of interpretation and evaluation. An explanation of how wildlife, watershed, and other resource data will be incorporated into an evaluation should be included in the plan.

**7.38 Training for Monitoring.** The monitoring plan should specify what type, how much, when, and by whom training will be provided. Provisions should be made for training new personnel as well as providing refresher and recalibration sessions for previously trained personnel. (See Section 4.) If parties outside BLM are responsible for collecting study data, they should receive appropriate training by BLM.



## RANGELAND MONITORING - PLANNING FOR MONITORING

GLOSSARY OF TERMS

## -A-

actual use: a report of the actual livestock grazing use certified to be accurate by the permittee or lessee. Actual use may be expressed in terms of animal unit months or animal months. (See 43 CFR 4100.0-5.)

allotment: an area of land designated and managed for grazing of livestock. Such an area may include intermingled private, State, or Federal lands used for grazing in conjunction with the public lands. (See 43 CFR 4100.0-5.)

allotment management plan (AMP): a documented program which applies to livestock grazing on the public lands, prepared in consultation, cooperation, and coordination with the permittee(s), lessee(s), or other involved affected interests. (See 43 CFR 4100.0-5.)

analysis: (1) a detailed examination of anything complex in order to understand its nature or determine its essential features; or (2) a separating or breaking up of any whole into its component parts for the purpose of examining their nature, function, relationship, etc. (A rangeland analysis includes an examination of both biotic (plants, animals, etc.) and abiotic (soils, topography, etc.) attributes of the rangeland.)

authorized officer: any person authorized by the Secretary of the Interior to administer the BLM's rangeland management program. (See 43 CFR 4100.0-5.)

## -C-

community: an assemblage of populations of plants and/or animals in a common spatial arrangement.

critical area: an area which must be treated with special considerations because of inherent site factors, size, location, condition, values, or significant potential conflicts among uses. Critical area is synonymous with crucial area.

crucial area: (See critical area.)

## -D-

density: numbers of individuals or stems per unit area. (Density does not equate to any kind of cover measurement.)

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-E-

ecological site: (See range site.)

ecological status: the present state of vegetation of a range site in relation to the potential natural community for the site. Ecological status is use independent. It is an expression of the relative degree to which the kinds, proportions, and amounts of plants in a community resemble that of the potential natural community. The four ecological status classes correspond to 0-25, 26-50, 51-75, or 76-100 percent similarity to the potential natural community and are called early seral, mid seral, late seral, and potential natural community, respectively.

endangered species: any species which is in danger of extinction throughout all or a significant portion of its range.

evaluation: (1) an examination and judgment concerning the worth, quality, significance, amount, degree, or condition of something; or (2) the systematic process for determining the effectiveness of on-the-ground management actions and assessing progress toward meeting management objectives.

-F-

frequency: a quantitative expression of the presence or absence of individuals of a species in a population. It is defined as the percentage of occurrence of a species in a series of samples of uniform size.

-G-

goal: the desired state or condition that a resource management policy or program is designed to achieve. A goal is usually not quantifiable and may not have a specific date by which it is to be completed. Goals are the base from which objectives are developed. (See objective.)

-I-

interpretation: explaining or telling the meaning of something and presenting it in understandable terms.

inventory: the systematic acquisition and analysis of information needed to describe, characterize, or quantify resources for land-use planning and management of the public lands.

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-K-

key area: a relatively small portion of a rangeland selected because of its location, use, or grazing value as an area on which to monitor the effects of grazing use. It is assumed that key areas, if properly selected, will reflect the effects of current grazing management over all or a part of a pasture, allotment, or other grazing unit.

key species: (1) those species which must, because of their importance, be considered in a management program; or (2) forage species whose use serves as an indicator to the degree of use of associated species.

-M-

monitoring: the orderly collection, analysis, and interpretation of resource data to evaluate progress toward meeting management objectives.

-O-

objective: planned results to be achieved within a stated time period. Objectives are subordinate to goals, are narrower and shorter in range, and have increased possibility of attainment. Time periods for completion and outputs or achievements that are measurable and quantifiable are specified. (See goal.)

-P-

pasture: grazing area enclosed and separated from other areas by fence or natural barrier.

potential natural community (PNC): the biotic community that would become established if all successional sequences were completed without interferences by man under the present environmental conditions. Natural disturbances are inherent in development. Includes naturalized non-native species.

public lands: any land and interest in land outside of Alaska owned by the United States and administered by the Secretary of the Interior through the Bureau of Land Management. (See 43 CFR 4100.0-5.)

## RANGELAND MONITORING - PLANNING FOR MONITORING

-R-

rangeland: a kind of land which supports vegetation useful for grazing on which routine management of that vegetation is through manipulation of grazing rather than cultural practices. (Rangelands include natural grasslands, savannas, shrublands, most deserts, tundra, alpine communities, coastal marshes, riparian zones, and wet meadows. Rangeland includes lands revegetated naturally or artificially to provide a plant cover which is managed like native vegetation.)

range site: a kind of rangeland with a specific potential natural community and specific physical site characteristics, differing from other kinds of rangeland in its ability to produce vegetation and to respond to management. Range sites are defined and described with soil, species composition, and production emphasis. Range site is synonymous with ecological site.

resource value rating (RVR): the value of vegetation present on a range site for a particular use or benefit. Resource value ratings may be established for each plant community capable of being produced on a range site, including exotic or cultivated species. On a given range site, each use (or potential use) has a separate resource value rating because that rating is based on classification of plants according to their value for a specific use. Some examples: A resource value rating for forage useful for cows and calves during the spring grazing season could be based on proper use factors (PUF's) or a more general assigning of plant species to good, moderate, or poor categories of forage value. Resource value ratings could then be based on production, cover, density, or frequency of plants in the different categories. A resource value rating for cover useful for a pronghorn fawning area might be based on density or cover of plants of a certain height or size class, without regard to plant species. A resource value rating related to scenic beauty might be based on abundance of flowering species, species with fall color, evergreens, diversity of growth forms, etc.

-S-

seral community: one of a series of biotic communities that follow one another in time on any given area. Seral community is synonymous with seral stage, successional community, and successional stage.

seral stage: (See seral community.)

stratification: subdividing an area into units which are, more or less, internally homogeneous with respect to the (those) characteristic(s) of interest.

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succession: the orderly process of community change; it is the sequence of communities which replace one another in a given area.

successional community: (See seral community.)

successional stage: (See seral community.)

-T-

threatened species: any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

trend: the direction of change in ecological status or in resource value ratings observed over time. Trend in ecological status is described as "toward" or "away from" the potential natural community or as "not apparent." Appropriate terms are used to describe trend in resource value ratings. Trends in resource value ratings for several uses on the same site at a given time may be in different directions, and there is no necessary correlation between trends in resource value ratings and trend in ecological status.

-U-

use: (See utilization).

utilization: the proportion or degree of current year's forage production that is consumed or destroyed by animals (including insects). May refer either to a single plant species, a group of species, or to the vegetation as a whole. Utilization is synonymous with use.

-V-

vegetation: plants in general, or the sum total of the plant life above and below ground in an area.

vegetation type: a kind of existing plant community with distinguishable characteristics described in terms of the present vegetation that dominates the aspect or physiognomy of the area.

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## RANGELAND MONITORING - PLANNING FOR MONITORING

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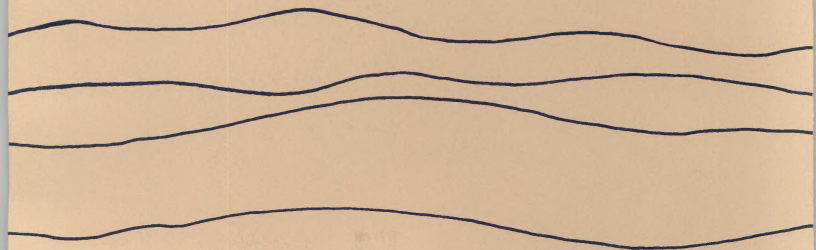
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## **Exhibit F**

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# RANGELAND MONITORING



*Bouteloua gracilis*

## Actual Use Studies



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# RANGELAND MONITORING

## ACTUAL USE STUDIES

TECHNICAL REFERENCE 4400-2

APRIL 1984

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## RANGELAND MONITORING - ACTUAL USE STUDIES

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APPENDIX B - ACTUAL USE DATA

Appendix B - Actual Use Data  
This appendix contains the actual use data collected during the monitoring period. The data is presented in a table format, with columns for the date, time, and location of the use. The data is sorted by date and time, and the location is listed in the third column. The data is presented in a table format, with columns for the date, time, and location of the use. The data is sorted by date and time, and the location is listed in the third column.

## RANGELAND MONITORING - ACTUAL USE STUDIES

1. ACTUAL USE DATA.

Actual livestock grazing use data are important in evaluating grazing management on specific areas of rangeland administered by the Bureau of Land Management (BLM). These data also provide the information needed to issue grazing bills based on actual grazing use. Data on wildlife, wild horse, and/or wild burro use should also be collected. In most situations, this use is estimated. The use by livestock may also be estimated where actual use data are not available. Care should be taken to distinguish between actual use and estimated use, particularly when they are used in allotment, wildlife habitat area, herd management area, watershed area, or other designated management area evaluations. Actual livestock grazing use data combined with estimated wildlife, wild horse, and wild burro use data are essential in evaluations which may result in changes in grazing management or revision of existing management plans. Knowledge and interpretation of past use provides a basis for future management decisions. Actual use figures alone have no meaning; they should be considered along with authorized use, estimated use, utilization, trend, climate, and any other data available for allotment or other management area evaluation.

2. COLLECTING ACTUAL USE DATA.

2.1 Timing of Studies. Actual use data are generally obtained annually or at the end of specified grazing periods. The authorized officer may collect actual use data and related information at any time during the year to substantiate or verify reported actual grazing use and/or to make comparisons with authorized grazing use.

2.2 Reliability of Actual Use Data. Every effort should be made to obtain complete and accurate data. Inaccurate actual use data may result in poor management decisions. Numbers of livestock and periods of use specified in grazing authorizations generally do not reflect actual use. Livestock operators often do not turn out the number of livestock for the periods of use specified in these authorizations.

2.3 Documenting Actual Use. Irrespective of how the data are collected, a record should be made of the actual grazing use. Actual use data generally consist of the name and/or number of an allotment or pasture on which livestock grazed, the number of livestock, the kind and/or class of livestock, and the period(s) of time the livestock actually grazed the allotment or pasture. These data and any other pertinent information should be filed, stored, and retained for use in evaluations.

## Section 3

## RANGELAND MONITORING - ACTUAL USE STUDIES

3. ACTUAL USE STUDY METHODS.

Study methods by which actual use data are obtained may be indirect or direct. Indirect methods involve obtaining actual use data from indirect sources such as reports submitted by livestock operators and reports from other agencies such as the Forest Service. Direct methods include personal contact, counting, marking, tagging, etc., in which the authorized officer is directly involved with the livestock operators on the allotments. The authorized officer determines priorities and selects the appropriate method for obtaining actual use data.

3.1 Indirect Methods. Indirect methods are used when it is not feasible to determine actual numbers of livestock on an allotment by use of a direct method. Use of indirect methods for gathering actual use data leave certain questions as to reliability of the data. This requires caution and mature judgment. Familiarity and knowledge of the livestock operations, coupled with spot-checks, generally should be sufficient to determine reliability of the data for evaluation purposes.

3.11 Actual Grazing Use Reports. Livestock operators may be asked to submit reports documenting actual livestock grazing use. These operators should be encouraged to keep complete and accurate records of grazing use. The authorized officer calculates the AUM's of grazing use from these records for use in evaluations. The information on these reports may also be used to issue billing notices at the end of the grazing period or year.

a. Livestock Operator Cooperation. An atmosphere of mutual trust and confidence should be developed with livestock operators. This will enhance their willingness to furnish accurate actual use data. Time and personnel limit the capability for the BLM to regulate actual use by policing action. The BLM should make every effort to inform the livestock operators concerning the importance of actual use data and how these data will benefit their operations in the long run.

b. Requesting Actual Use Data. Actual grazing use reports may be sent to the livestock operators annually prior to the beginning of their earliest authorized grazing period on the public lands. These reports may be delivered and discussed personally with the livestock operators. The livestock operators should be encouraged to keep their actual use records up-to-date. After completing their authorized grazing use, they can mail the reports directly to the local BLM Resource Area or District Office.

c. Actual Use Spot Checks. Spot checks may be made of a portion of the livestock operators each year for verification of the reported actual use.

## Section 3.12

## RANGELAND MONITORING - ACTUAL USE STUDIES

3.12 Forest Service Counts. The Forest Service often counts livestock, either when they are being moved directly onto the National Forest from the operators' owned or controlled land, or when being moved from BLM allotments on the public lands onto the National Forest. The authorized officer may either participate in these counts or obtain the count information from the Forest Service.

3.2 Direct Methods. The authorized officer can generally depend upon the reliability of actual use data obtained by direct methods. One of these methods is generally employed where efforts are being made to control unauthorized livestock grazing use and/or where identification of the livestock is difficult.

3.21 Counting. Counting livestock, either when they are being moved onto an allotment or moved from an allotment, is a method of obtaining actual use data. Counting animals on the allotment where they are actually grazing is another reliable source of actual use data. Livestock counts should be documented. (See Section 2.3.) All field notes concerning the counts should be maintained as back-up information. Counting may also be used for documenting use by wildlife, wild horses, and wild burros. Counting, especially aerial counts, often underestimates use by wildlife, wild horses, and wild burros.

a. Ground Counts. Counting animals on the ground can be accomplished through the use of vehicles, horses, and in some cases, on foot. These means of counting have advantages and limitations depending on terrain, absence or presence of roads, size of allotment, type of vegetation, etc. Generally the most accurate counts are obtained from ground counts.

b. Aerial Counts. In open grasslands or low-shrub range, aerial counts can be an effective tool for gathering actual use data. Aerial counts of animals grazing in tree and tall brush-covered terrain have limited value because the animals are difficult to spot. Aerial counts are often best suited for identifying problem areas. It is difficult to assess the age of animals from the air. The ownership of livestock generally cannot be determined from the air.

c. Aerial Photographs. Enlarged aerial photographs of grazing animals may be used to obtain actual use data. The reliability of these data is questionable and the cost of acquiring the photos may not be justified.

## Section 3.22

## RANGELAND MONITORING - ACTUAL USE STUDIES

3.22 Marking. Marking is most valuable for controlling unauthorized grazing use but can also be used to count livestock on allotments. Livestock are marked with a dye which bleaches fibers (hair or wool) or with paint. These marks can be seen from a considerable distance which permits rapid counting. Livestock are carefully marked after the period when fibers are being shed. The mark is only as permanent as the current growth of fiber. Several hundred livestock in a chute can be marked within an hour. Marking programs of this nature should be handled by qualified persons. The Government is liable for tort claims if the dye is not used cautiously and injury occurs. Pellet-marking guns which permit the paint marking of livestock from a distance of up to 50 feet, fire a breakable paint-filled pellet. This pellet gun allows for easy and rapid marking of livestock with minimal handling of the animals. The number of livestock that are marked should be documented. (See Section 2.3.)

3.23 Tagging. Tagging livestock is best adapted for controlling unauthorized grazing use, but it is also a reliable means for determining actual use on allotments. Several types of metal and plastic ear tags are available. The tagging program requires considerable handling of the livestock, but the extra time and effort is justified for problem areas and areas under intensive management. The number of livestock that are tagged should be documented. (See Section 2.3.)

## RANGELAND MONITORING - ACTUAL USE STUDIES

GLOSSARY OF TERMS

-A-

actual use: a report of the actual livestock grazing use certified to be accurate by the permittee or lessee. Actual use may be expressed in terms of animal unit months or animal months. (See 43 CFR 4100.0-5.)

allotment: an area of land designated and managed for grazing of livestock. Such an area may include intermingled private, State, or Federal lands used for grazing in conjunction with the public lands. (See 43 CFR 4100.0-5.)

allotment management plan (AMP): a documented program which applies to livestock grazing on the public lands, prepared in consultation, cooperation, and coordination with the permittee(s), lessee(s), or other involved affected interests. (See 43 CFR 4100.0-5.)

analysis: (1) a detailed examination of anything complex in order to understand its nature or determine its essential features; or (2) a separating or breaking up of any whole into its component parts for the purpose of examining their nature, function, relationship, etc. (A rangeland analysis includes an examination of both biotic (plants, animals, etc.) and abiotic (soils, topography, etc.) attributes of the rangeland.)

animal month: a month's tenure upon the rangeland by one animal. Animal month is not synonymous with animal unit month.

animal unit month (AUM): the amount of forage necessary for the sustenance of one cow or its equivalent for a period of one month. (See 43 CFR 4100.0-5.)

authorized officer: any person authorized by the Secretary of the Interior to administer the BLM's rangeland management program. (See 43 CFR 4100.0-5.)

-C-

class of livestock: the age and/or sex groups of a kind of livestock.

-E-

ecological status: the present state of vegetation of a range site in relation to the potential natural community for the site. Ecological status is use independent. It is an expression of the relative degree to which the kinds, proportions, and amounts of plants in a community resemble that of the potential natural community. The four ecological status classes correspond to 0-25, 26-50, 51-75, or 76-100 percent similarity to the potential natural community and are called early seral, mid seral, late seral, and potential natural community, respectively.

## RANGELAND MONITORING - ACTUAL USE STUDIES

### -E- (cont.)

estimated use: the use made of forage on an area by wildlife, wild horses, wild burros, and/or livestock where actual use data are not available. Estimated use may be expressed in terms of animal unit months or animal months.

evaluation: (1) an examination and judgment concerning the worth, quality, significance, amount, degree, or condition of something; or (2) the systematic process for determining the effectiveness of on-the-ground management actions and assessing progress toward meeting management objectives.

### -G-

goal: the desired state or condition that a resource management policy or program is designed to achieve. A goal is usually not quantifiable and may not have a specific date by which it is to be completed. Goals are the base from which objectives are developed. (See objective.)

### -I-

interpretation: explaining or telling the meaning of something and presenting it in understandable terms.

### -K-

kind of livestock: species of domestic livestock--cattle, sheep, horses, burros, and goats.

### -M-

monitoring: the orderly collection, analysis, and interpretation of resource data to evaluate progress toward meeting management objectives.

### -O-

objective: planned results to be achieved within a stated time period. Objectives are subordinate to goals, are narrower and shorter in range, and have increased possibility of attainment. Time periods for completion and outputs or achievements that are measurable and quantifiable are specified. (See goal.)

## RANGELAND MONITORING - ACTUAL USE STUDIES

-P-

pasture: grazing area enclosed and separated from other areas by fence or natural barrier.

potential natural community (PNC): the biotic community that would become established if all successional sequences were completed without interferences by man under the present environmental conditions. Natural disturbances are inherent in development. Includes naturalized non-native species.

public lands: any land and interest in land outside of Alaska owned by the United States and administered by the Secretary of the Interior through the Bureau of Land Management. (See 43 CFR 4100.0-5.)

-R-

rangeland: a kind of land which supports vegetation useful for grazing on which routine management of that vegetation is through manipulation of grazing rather than cultural practices. (Rangelands include natural grasslands, savannas, shrublands, most deserts, tundra, alpine communities, coastal marshes, riparian zones, and wet meadows. Rangeland includes lands revegetated naturally or artificially to provide a plant cover which is managed like native vegetation.)

resource value rating (RVR): the value of vegetation present on a range site for a particular use or benefit. Resource value ratings may be established for each plant community capable of being produced on a range site, including exotic or cultivated species. On a given range site, each use (or potential use) has a separate resource value rating because that rating is based on classification of plants according to their value for a specific use. Some examples: A resource value rating for forage useful for cows and calves during the spring grazing season could be based on proper use factors (PUF's) or a more general assigning of plant species to good, moderate, or poor categories of forage value. Resource value ratings could then be based on production, cover, density, or frequency of plants in the different categories. A resource value rating for cover useful for a pronghorn fawning area might be based on density or cover of plants of a certain height or size class, without regard to plant species. A resource value rating related to scenic beauty might be based on abundance of flowering species, species with fall color, evergreens, diversity of growth forms, etc.

## RANGELAND MONITORING - ACTUAL USE STUDIES

-T-

trend: the direction of change in ecological status or in resource value ratings observed over time. Trend in ecological status is described as "toward" or "away from" the potential natural community or as "not apparent." Appropriate terms are used to describe trend in resource value ratings. Trends in resource value ratings for several uses on the same site at a given time may be in different directions, and there is no necessary correlation between trends in resource value ratings and trend in ecological status.

-U-

use: (See utilization.)

utilization: the proportion or degree of current year's forage production that is consumed or destroyed by animals (including insects). May refer either to a single plant species, a group of species, or to the vegetation as a whole. Utilization is synonymous with use.

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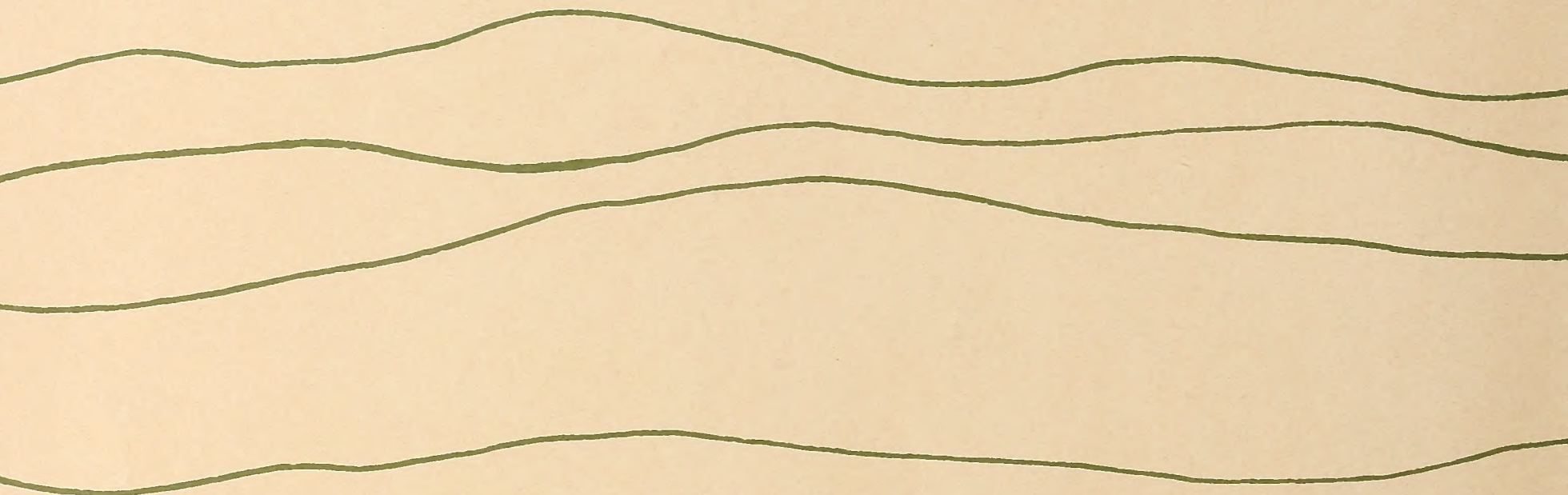
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## **Exhibit G**

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# RANGELAND MONITORING

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*Festuca idahoensis*

## Utilization Studies

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## RANGELAND MONITORING - UTILIZATION STUDIES

## 1. UTILIZATION DATA.

Utilization data are important in evaluating the effects of grazing and browsing on specific areas of rangeland administered by the Bureau of Land Management (BLM) for livestock, wildlife, wild horse, and wild burro use. Utilization is generally expressed as a percentage of available forage weight or numbers of plants, twigs, etc., that have been consumed or destroyed. Utilization is expressed in terms of the current year's production removed. Permittees, lessors, other rangeland users, and interested parties should be consulted and encouraged to participate in the collection and use of utilization data. (See Sections 2.2 through 2.4, Technical Reference 4400-1.)

**1.1 Short-term Use of Utilization Data.** In the short-term, utilization data are considered with actual use and climate data to determine resource use levels and to identify needed adjustments in management actions. These same data can be used in the short-term as the basis for adjusting grazing use by agreement or grazing decision.

**1.2 Long-term Use of Utilization Data.** Utilization data are considered along with actual use, authorized use, estimated use, trend, climate, and any other data available or necessary for allotment, wildlife habitat area, herd management area, watershed area, or other designated management area evaluations. Evaluations are conducted to determine if management actions and/or practices are achieving short-term and long-term management objectives identified in the land-use, coordinated resource management, and activity plans.

## 2. COLLECTING UTILIZATION DATA.

**2.1 Frequency of Studies.** Utilization studies may be conducted as frequently as needed to satisfy data requirements for allotment, wildlife habitat area, herd management area, watershed area, or other designated management area evaluations. In some cases, utilization studies are started upon initiation of intensive management and continued annually through one complete cycle of a grazing system, or for as long as necessary. It may be necessary to conduct utilization studies annually until management objectives are achieved and maintained. Utilization studies may also be conducted at periodic intervals in sequence with grazing treatments. For example, utilization studies on individual pastures could be conducted once every three years on a three-pasture grazing system and once every five years on a five-pasture grazing system. Where studies are conducted only once during each grazing cycle, they should be conducted at the same point in each cycle so that the data will be comparable.

## RANGELAND MONITORING - UTILIZATION STUDIES

2.2 Timing of Studies. Utilization studies are generally conducted at the end of each period of use within pastures or allotments. They may also be conducted at any time during the period of use. Where livestock, wildlife, wild horses, and/or wild burros are present, it may be necessary to conduct utilization studies both before and after discrete periods of use by these animals to estimate the percent utilization by kind of animal. Where regrowth may occur, utilization studies should be conducted as soon as possible following the end of the period of use. (See Section 3.6.) Utilization studies on browse species must be conducted before new twig growth occurs to obtain accurate measurements or observations of past use.

2.3 Documentation. Utilization data are recorded on appropriate forms. Forms for the utilization study methods described in this Technical Reference are included in the Illustrations Section. Close-up and/or general view photographs may be used with any of the utilization study methods. (See Section 3.4, Technical Reference 4400-4.) File the forms, photographs, and any other pertinent information in the allotment file or as otherwise prescribed. (See Section 6, Technical Reference 4400-1.)

### 3. KEY CONSIDERATIONS.

Consistency is important in measuring or estimating utilization.

3.1 Plant Species Identification. It is important that the plant species be properly identified when conducting utilization studies. In some cases, it may be helpful to include pressed plant specimens, photographs, or other aids used for species identification in the study file. If data are collected prior to positive species identification, examiners should collect plant specimens for later verification.

3.2 Percent Utilization. "Desired," or "target," utilization levels for specific areas of rangeland are reflected in the management objectives of land-use, coordinated resource management, and activity plans. These levels refer to the desired utilization of key plant species or several plant species within a key area. The desired percent utilization for a plant species can vary from plant community to plant community. It can also vary depending on period of use, previous intensity of use, and growth conditions or vigor of the plants. Other demands, such as concurrent or seasonal use by more than one animal species, may also be important in the selection of the desired utilization level. Percent utilization is expressed in terms of plant species and locality.

3.3 Plants Used to Determine Utilization. Generally, only plants of the selected key species are used in utilization studies. This does not preclude sampling plants of other species on the key area if these additional data are needed.

## RANGELAND MONITORING - UTILIZATION STUDIES

3.4 Plant Height-Weight Relationship. Weight is not evenly distributed throughout the height or length of plants of any given species. For most rangeland plants, a high percentage of the weight is in the basal portion of the plant or twig where growth is thicker or more dense. A low percentage of plant weight is in the upper portion where growth is tapered or less dense. When estimating percent utilization, adjust for differences in weight by height or length. Weight distribution in relation to height is reasonably constant among individuals of the same plant species.

3.5 Utilization Cages. Utilization cages are used to provide a guide to utilization and production. Grasses, forbs, and shrubs can be protected from foraging with these cages. Utilization cages should not appreciably disrupt normal vegetation growth. The cages must be moved each year at the beginning of the foraging period. This will allow for comparison of rangelands inside and outside the protected plots. These cages can be used to show utilization rates to all interested parties. They can also be used to collect information showing forage production fluctuations due to yearly climatic changes. (See Section 5.21e(3) and Appendix.)

3.6 Regrowth. Regrowth is the plant growth that occurs following an interruption of growth by grazing, fire, etc., as well as the plant growth that occurs in response to favorable weather events following the normal growing season. When animals use the same area more than once a year and plant regrowth may occur or has occurred, utilization is still based on the amount of growth available at the time the data are collected. The percent utilization after each period of use represents only the amount of available growth that has been utilized up to the time the studies are conducted. Utilization percentages recorded for various periods of use during a year cannot be added together to get total utilization for the year. In other words, 30 percent utilization of 6 inches of plant growth available in the spring, and 30 percent utilization of 12 inches of plant growth available in the fall, do not add up to 60 percent utilization for the year.

3.7 Transects. Utilization transects are located within representative portions of the key areas. (See Section 5.12, Technical Reference 4400-1.)

3.71 Starting Point. The starting point of a transect is located in relation to a known reference marker.

3.72 Bearing or Direction. The bearing or direction of the transect from the starting point should either be set by compass or directed toward a permanent, clearly-defined, highly visible, natural feature. Straight line transects should cross drainages, if possible, in order to obtain a representative sample of the key area. Where the uplands and drainages have significantly different levels of utilization, they should not be included within the same key area since extremes in percent utilization on one portion of the key area may mask extremes on other portions of the area.

## Section 3.73

## RANGELAND MONITORING - UTILIZATION STUDIES

3.73 Observations and Plots.

a. Sampling Interval. Observations or plots are located at constant intervals along a transect. If the key species or other selected species is not present at the selected interval, relocate the observation or plot point to the nearest individual of that species along the transect line. The next interval along the transect is measured from this relocated point.

b. Observation Sites. Exercise care to ensure that observation sites do not overlap.

c. Plot Size. If plots are used, all plots on a transect must be of the same size so that the individual plot percentages may be added together and averaged.

d. Number of Observations or Plots. A minimum of 25 observations or plots is recommended for collecting utilization data on key areas. Normally, between 25 and 100 observations or plots will give consistent results. Inaccuracies produced by estimating utilization tend to be reduced as a larger number of samples is taken.

e. Marking Locations. The location of the observations or plots along the transect may be recorded on a map or aerial photo.

3.74 Transect Documentation. Record the location, starting point, direction, sampling interval, and other pertinent information concerning a transect on the Study Location and Documentation Data Form. (See Illustration 1, this Reference, and Section 6, Technical Reference 4400-1.) This documentation enables the examiners to conduct follow-up studies in a consistent manner to provide comparable data for analysis, interpretation, and evaluation.

4. UTILIZATION PATTERNS (USE ZONES).

Rangelands include various combinations of range sites and vegetation types on which utilization is seldom uniform. Utilization patterns (use zones) may result from a number of factors which either alone or in combination cause foraging animals to concentrate in specific areas or to spread out over large areas.

4.1 Base for Mapping Utilization Patterns. Aerial photographs, ortho-photo quads, or topographic maps are good bases on which to map utilization patterns. It is important that the selected base show range sites or vegetation types and physical features such as fences, water, and roads. If utilization patterns are mapped on mylar overlays on the base map, the patterns can easily be compared between years.

## RANGELAND MONITORING - UTILIZATION STUDIES

4.2 Mapping Utilization Patterns. The first step in conducting utilization studies is the preparation of a map which shows the forage utilization patterns in a pasture, allotment, or other unit. Mapping utilization patterns involves traversing the allotment or pasture to obtain a general concept of these patterns. Features such as topography, rockiness, size of area, location of salt, and distance from water affect foraging habits of the different kinds of animals. These features are helpful in denoting utilization patterns and mapping their boundaries. Permittees, lessees, other rangeland users, and interested parties should be consulted and encouraged to participate in the mapping of utilization patterns. (See Section 2.4, Technical Reference 4400-1.) Unused areas suitable for grazing and areas of animal concentration should be delineated to help identify range improvements needed to change grazing use distribution. Unsuitable areas should also be delineated. Utilization patterns may be mapped for wildlife, wild horses, or wild burros, as well as for livestock following discrete use periods by these animals. Mapped utilization patterns can be used to stratify an allotment or pasture and to select key areas. (See Section 5.11b(6), Technical Reference 4400-1.)

## 5. UTILIZATION STUDY METHODS.

5.1 Selecting a Method. In the selection of a utilization study method, remember that no one method is suitable for all situations. Carefully consider the advantages and limitations of each method with respect to the area and purpose for which the study will be conducted. Estimation methods permit collection of a greater number of samples than methods that require measuring or clipping and weighing (with the same time and personnel). However, the accuracy of the estimates is dependent on the training and experience of the examiners.

### 5.2 Methods for Herbaceous Species.

5.21 PAIRED PLOT METHOD. Under the Paired Plot Method, forage from protected and unprotected plots is clipped and weighed at the end of the foraging period. The difference represents the amount of forage consumed by animals or otherwise destroyed during that period.

a. Areas of Use. This method is suitable for all vegetation growth forms for which production and utilization data are commonly desired. It is particularly applicable where periods of use are short, utilization relatively uniform, and regrowth after foraging is not significant.

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b. Advantages and Limitations. The method is a simple and direct way of measuring forage utilization. Little training is required and accuracy is generally high. The chief limitations are that it is time-consuming and that a check area, protected from foraging, is required. Also, where periods of use are long, the method does not provide information about the cumulative production of foraged plants unless the cages are moved at short time intervals.

c. Equipment.

(1) Study Location and Documentation Data Form. (See Illustration 1.)

(2) Utilization Study Data - Paired Plot Method Form. (See Illustration 2.)

(3) Frames to delineate plots.

(4) Portable cages to protect plots.

(5) Stakes for anchoring cages.

(6) Hammer for pounding stakes.

(7) Clipping shears.

(8) Paper sacks.

(9) Spring scale, calibrated in grams.

d. Training. The Paired Plot Method does not require intensive training for field application. Examiners must be able to identify plant species. Examiners can perform the actual clipping and weighing after only a short training period. (See Section 3, this Reference, and Section 4, Technical Reference 4400-1.)

e. Establishing Studies. Select key area(s) and key species and determine the number, size, and location of the plots. (See Section 3, this Reference, and Section 5, Technical Reference 4400-1.)

(1) Plot Location. Locate paired plots within key area(s). Mark the location of the plots so they can be relocated. Record the location and documentation of the study on the Study Location and Documentation Data Form. (See Illustration 1, this Reference, and Section 6, Technical Reference 4400-1.)

(a) Plant Composition and Growth. Plant composition and amount of growth must be similar in both plots. Each plot must contain the key species.

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(b) Continuing Study. Clipping the plants has a marked influence on their physiological activities and the ecology of the site. Therefore, plots cannot be used again after they are clipped. New plots must be selected for continuing study.

(2) Number of Plots. Establish at least three sets of paired plots (three protected and three unprotected) in each key area selected for study. This is a minimum; establish more if needed.

(3) Protected Plots. Protect one plot of each pair from foraging. Flip a coin to decide which plot to protect.

(a) Cages. Anchor a cage over one of the paired plots at each plot location. See Appendix for examples of several kinds of utilization cages. The base of a cage should be large enough to provide at least a 6-inch buffer zone between the edge of the plot and the side of the cage. The lower portion of the cage (to approximately one to two feet high) may be covered with wire netting small enough to exclude rabbits and rodents. Generally, the larger the mesh, the less influence the cage has in modifying the environment. (See Section 3.5.)

(b) Exclosures. Protected plots may be located in exclosures. These plots need not be caged unless it is necessary to exclude rabbits and rodents.

i. Permanent Exclosures. If protected plots are located within permanent exclosures, caution must be exercised to ensure that these plots are representative of the unforaged situation outside the exclosures.

ii. Temporary Exclosures. Protected plots may be located within temporary exclosures, such as exclosures constructed with electric fence. Plots protected by temporary exclosures can be moved every year to eliminate the artificial environment created by continued non-use in permanent exclosures.

(4) Unprotected Plots. Leave one plot of each pair open to foraging. If past experience shows that foraging is particularly uneven, leave two or more plots open for each one caged in order to average the unevenly foraged conditions. Animals are attracted to cages and may trample unprotected plots if located too near protected plots. Therefore, establish unprotected plots a minimum of 100 feet from protected plots. Unprotected plots should be inconspicuously marked to avoid attracting animals.

f. Sampling Process. After examiners are trained, proceed with the collection of utilization data.

(1) Clip current year's growth on key species from protected and unprotected plots.

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(2) On herbaceous species, clip all current year's growth to ground level.

(3) On browse species, remove all current year's growth available for foraging animals. For large browse plants, the available current year's growth may be removed from part of the plant rather than from the whole plant. The proportion of the browse removed is then converted to total weight based on sample size. (Example: If one-fourth of the available current year's growth of browse on a browse plant is removed, the weight of the browse removed times four equals the total weight.)

(4) Put the clippings from the protected and unprotected plots in separate paper sacks for weighing.

(5) Weigh the sacks of clipped plants and record separately the weight from the protected and unprotected plots on the Utilization Study Data - Paired Plot Method Form. (See Illustration 2.) Subtract the weight of the sack before recording the weights of the plants.

g. Calculating Percent Utilization.

(1) Calculate the percent utilization as follows:

$$\% \text{ utilization} = \frac{\text{total protected weight} - \text{total unprotected weight}}{\text{total protected weight}} \times 100$$

(2) If an unequal number of protected and unprotected plots are used in the study, calculate the percent utilization as follows:

$$\% \text{ utilization} = \frac{\frac{\text{average weight for protected plots}}{\text{average weight for protected plots}} - \frac{\text{average weight for unprotected plots}}{\text{average weight for protected plots}}}{\text{average weight for protected plots}} \times 100$$

(3) Record the percent utilization on the Utilization Study Data - Paired Plot Method Form. (See Illustration 2.)

5.22 OCULAR ESTIMATE METHOD. The Ocular Estimate Method is used to determine utilization along a transect by ocular estimate of the percentage by weight of forage removed from individual plants of the key species or from all plants of the key species on small plots.

a. Areas of Use. This method has wide applicability and is suited for use with grasses and forbs.

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b. Advantages and Limitations. The most important advantage is speed. The method is also reasonably accurate, depending upon the ability of the examiners. Vegetation is not disturbed. Reliability of estimates is increased by limiting observations to individual plants or small areas (plots). Errors in personal judgment on individual plants or plots frequently tend to be compensating. A limitation is that exclosures, cages, or fenced areas may be needed for training.

c. Equipment.

- (1) Study Location and Documentation Data Form. (See Illustration 1.)
- (2) Utilization Study Data - Ocular Estimate Method Form. (See Illustration 3.)
- (3) Frames to delineate plots (if necessary).
- (4) Clipping shears.
- (5) Paper sacks.
- (6) Spring scale, calibrated in grams.

d. Training. The accuracy of utilization percentage estimates is dependent upon thoroughness of training and ability of examiners to identify the plant species and to estimate amount of use. The examiners must first compare their ocular estimates against actual weight values obtained by clipping and weighing. (See Section 3, this Reference, and Section 4, Technical Reference 4400-1.)

(1) Training Sites. Locate sites for training purposes on key areas or on similar unforaged or protected sites. If it is unlikely that a site containing unforaged vegetation will be available after the foraging season, it will be necessary to construct temporary exclosures or install cages on key areas prior to the period of use.

(2) Making Ocular Estimates. Training involves estimating utilization on individual plants of the key species or on all plants of the key species on a small plot. If plots are to be used for the studies, use plots of the same size for training. (See Section 3.73c.) The plots should be small enough so that the entire plot is clearly visible to the examiner. Examiners should practice making ocular estimates as follows:

- (a) Clip individual plants of the key species, or plants of the key species on a plot, to simulate foraging (sample A).
- (b) Estimate the percentage of weight removed.

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(c) Clip the remaining forage of the selected plants by removing all current year's growth available to the foraging animals (sample B).

(d) Put the clippings for samples A and B in separate paper sacks.

(e) Weigh samples A and B separately and subtract sack weight from the weight of each sample.

(f) Calculate the percent simulated use by dividing the weight of sample A by the combined weight of samples A and B and multiplying the value by 100.

(g) Compare estimates with the actual percent forage removed and determine the error of the estimates. Continue training until examiners can recognize the different percentages of use with minimum acceptable error.

(3) Checking Ocular Estimates. Training checks should be made and recorded each day prior to field estimation. This gives a permanent record of the accuracy of each examiner's ocular estimates.

e. Establishing Studies. Select key area(s) and key species and determine the number, length, and location of the transects. (See Section 3, this Reference, and Section 5, Technical Reference 4400-1.) Document the location and other pertinent information concerning a transect on the Study Location and Documentation Data Form. (See Illustration 1, this Reference, and Section 6, Technical Reference 4400-1.)

f. Sampling Process. After examiners are trained and are confident in their ability to recognize various degrees of utilization, proceed with the collection of utilization data.

(1) At each interval along a transect, select the plant of the key species nearest the toe and estimate and record the percent utilization.

(2) If a plot is being used, place the frame immediately in front of the toe or on the nearest site having the key species and estimate and record the percent utilization.

(3) Record the percent utilization on the Utilization Study Data - Ocular Estimate Method Form. (See Illustration 3.)

g. Calculating Percent Utilization. Calculate the average percent utilization by totaling the utilization estimates for the plants or plots along the transect and dividing the total by the number of sampled plants or plots. Record the average utilization on the Utilization Study Data - Ocular Estimate Method Form. (See Illustration 3.)

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5.23 KEY FORAGE PLANT METHOD. The Key Forage Plant Method is an ocular estimate of forage utilization within one of six utilization classes. Observations are made of the appearance of the rangeland and especially the key species, along a transect which traverses the key area.

a. Areas of Use. This method is adapted to areas where perennial grasses, forbs, and/or browse plants are the key species and utilization data must be obtained over large areas using few examiners.

b. Advantages and Limitations. This method is rapid and does not require unused areas for training purposes. Estimates are based on a descriptive term representing a broad range (class) of utilization rather than a precise amount. Different examiners are more likely to estimate utilization in the same classes than to estimate the same utilization percentages.

c. Equipment.

(1) Study Location and Documentation Data Form. (See Illustration 1.)

(2) Utilization Study Data - Key Forage Plant Method Form. (See Illustration 4.)

(3) Tally counter (optional).

d. Training. Personal judgment is involved in any estimation method. Estimates are only as good as the training and experience of the examiners. (See Section 3, this Reference, and Section 4, Technical Reference 4400-1.) The training described for the Ocular Estimate Method often helps examiners using this method make the utilization class estimations. (See Section 5.22d.) This method requires that the examiners be trained to:

(1) Identify the plant species.

(2) Recognize the six herbaceous or six browse utilization classes using the written class descriptions.

(3) Think in terms of the general appearance of the rangeland (slightly used, heavily used, etc.) at each observation point, rather than weight or height removed.

e. Establishing Studies. Select key area(s) and key species and determine the number, length, and location of the transects. (See Section 3, this Reference, and Section 5, Technical Reference 4400-1.) Document the location and other pertinent information concerning a transect on the Study Location and Documentation Data Form. (See Illustration 1, this Reference, and Section 6, Technical Reference 4400-1.)

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f. Sampling Process. After examiners are trained and have confidence in their ability to judge utilization by utilization class ("light", "heavy", etc.), proceed with the collection of utilization data. At each observation point along the transect, estimate the utilization class using the written description of the class. In those cases where part of a class description does not apply (example: percentage of seedstalks remaining), judge utilization based on those parts of the description that do apply. An observation point is the immediate area containing the key species visible to examiners when standing at a particular location along the transect. (See Section 3.73b.) Record the estimates by dot count by utilization class on the Utilization Study Data - Key Forage Plant Method Form. (See Illustration 4.)

(1) Herbaceous Utilization Classes. Six utilization classes are used to show relative degrees of use of key herbaceous species (grasses and forbs). Each class represents a numerical range of percent utilization. Estimate utilization within one of the six classes. Utilization classes are described as follows:

(a) No Use (0-5%). The rangeland shows no evidence of grazing use; or the rangeland has the appearance of negligible grazing.

(b) Slight (6-20%). The rangeland has the appearance of very light grazing. The key herbaceous forage plants may be topped or slightly used. Current seedstalks and young plants of key herbaceous species are little disturbed.

(c) Light (21-40%). The rangeland may be topped, skimmed, or grazed in patches. The low value herbaceous plants are ungrazed and 60 to 80 percent of the number of current seedstalks of key herbaceous plants remain intact. Most young plants are undamaged.

(d) Moderate (41-60%). The rangeland appears entirely covered as uniformly as natural features and facilities will allow. Fifteen to 25 percent of the number of current seedstalks of key herbaceous species remain intact. No more than 10 percent of the number of low value herbaceous forage plants are utilized. (Moderate use does not imply proper use.)

(e) Heavy (61-80%). The rangeland has the appearance of complete search. Key herbaceous species are almost completely utilized with less than 10 percent of the current seedstalks remaining. Shoots of rhizomatous grasses are missing. More than 10 percent of the number of low value herbaceous forage plants have been utilized.

(f) Severe (81-100%). The rangeland has a mown appearance and there are indications of repeated coverage. There is no evidence of reproduction or current seedstalks of key herbaceous species. Key herbaceous forage species are completely utilized. The remaining stubble of preferred grasses is grazed to the soil surface.

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(2) Browse Utilization Classes. Six utilization classes show relative degrees of use of available current year's growth (leaders) of key browse plants (shrubs, half shrubs, woody vines, and trees). Each class represents a numerical range of percent utilization. Estimate utilization within one of the six classes. Utilization classes are described as follows:

(a) No Use (0-5%). Browse plants show no evidence of use; or browse plants have the appearance of negligible use.

(b) Slight (6-20%). Browse plants have the appearance of very light use. The available leaders of key browse plants are little disturbed.

(c) Light (21-40%). There is obvious evidence of leader use. The available leaders appear cropped or browsed in patches and 60 to 80% of the available leader growth of the key browse plants remains intact.

(d) Moderate (41-60%). Browse plants appear rather uniformly utilized and 40 to 60% of the available leader growth of key browse plants remains intact.

(e) Heavy (61-80%). The use of the browse gives the appearance of complete search. The preferred browse plants are hedged and some plant clumps may be slightly broken. Nearly all available leaders are used and few terminal buds remain on key browse plants. Between 20 to 40% of the available leader growth of the key browse plants remains intact.

(f) Severe (81-100%). There are indications of repeated coverage. There is no evidence of terminal buds and usually less than 20% of available leader growth on the key browse plants remains intact. Some, and often much, of the second and third years' growth of the browse plants has been utilized. Hedging is readily apparent and the browse plants are more frequently broken.

g. Calculating Percent Utilization. Calculate the percent utilization as follows:

(1) Convert the dot count to the number of observations for each utilization class.

(2) Multiply the number of observations in each utilization class times the midpoints of the class intervals.

(3) Total the products for all classes.

(4) Divide the sum by the total number of observations on the transect.

(5) Record the average percent utilization on the Utilization Study Data - Key Forage Plant Method Form. (See Illustration 4.)

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5.24 HEIGHT-WEIGHT METHOD. The Height-Weight Method involves the measurement of heights of ungrazed and grazed grass or grasslike plants to determine average utilization. Measurements of plant heights recorded along transects are converted to percent of weight utilized by means of a utilization gauge (Lommasson and Jensen 1943). The utilization gauge is developed from height-weight relationship curves. This method provides a mechanical tool which can be used for training, checking personal judgment, and promoting uniformity of results between examiners as well as for determining percent utilization.

a. Areas of Use. This method is adapted for obtaining utilization data where the key species are either bunch or rhizomatous/sod-forming grasses or grasslike species.

b. Advantages and Limitations. This method provides for uniform, accurate, and reliable utilization determinations for perennial grasses and grasslike species. It is an objective method; however, some estimation is required. Accurate utilization scales may not be available for the key species. The development of the height-weight relationship curves and preparation of utilization gauge scales can be time-consuming. This method is not used for determining utilization of forbs and shrubs.

c. Equipment.

- (1) Study Location and Documentation Data Form. (See Illustration 1.)
- (2) Utilization Study Data - Height-Weight Method Form. (See Illustration 5.)
- (3) Utilization gauge. (See Illustration 6.)
- (4) Utilization scales for key species. (See Illustration 6, pages 2 and 3.)
- (5) Tape measure or ruler.
- (6) Additional equipment needed to prepare utilization scales:
  - (a) Clipping shears
  - (b) Thread
  - (c) Paper trimmer (for clipping plants into segments)
  - (d) Paper sacks
  - (e) Scale calibrated in tenths of grams
  - (f) Graph paper

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(g) Blank card for utilization gauge.

d. Training. This method does not require intensive training for field application. Examiners must be able to identify the plant species. Examiners measure and record the height of grazed and ungrazed plants, determine the utilization of individual plants from the gauge, and calculate the average utilization by key species. (See Section 3, this Reference, and Section 4, Technical Reference 4400-1.)

e. Establishing Studies. Select key area(s) and key species and determine the number, length, and location of the transects. (See Section 3, this Reference, and Section 5, Technical Reference 4400-1.) Document the location and other pertinent information concerning a transect on the Study Location and Documentation Data Form. (See Illustration 1, this Reference, and Section 6, Technical Reference 4400-1.)

f. Sampling Process. Sample ungrazed and grazed plants encountered along a transect to determine the average ungrazed plant height and the average percent utilization. To secure reliable utilization determinations, it is essential to measure heights for an adequate number of ungrazed and grazed plants. The greater the variation in utilization between plants, the more plants required to determine the average utilization.

(1) Measuring Plant Heights.

(a) Best results are obtained by placing the measuring tape or ruler in the center of the bunch or turf circle, rather than along one side. The tape or ruler should not be forced down into the crown but should rest firmly on the cushioned portion of the plant.

(b) Where rhizomatous/sod-forming grasses or grasslike plants are the key species, use a circle of turf two inches in diameter as one plant.

(2) Sampling Plants

(a) At each interval along the transect, select the plant of the key species (seedlings excepted) nearest the toe and measure the height of the plant to the nearest 1/4 inch. If plants are not evenly grazed, determine the average stubble height.

(b) If the selected plant has not been grazed, record the height for that sample in the Ungrazed Height Column on Utilization Study Data - Height-Weight Method Form. (See Illustration 5.)

(c) If the selected plant has been grazed, record the height for that sample in the Grazed Height Column on the Utilization Study Data - Height-Weight Method Form. (See Illustration 5.)

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(d) Measure at least twenty ungrazed plants to obtain a reliable cross section of ungrazed plant heights. If a sufficient number of ungrazed plants is not encountered along the transect on the key area, it may be necessary to extend the transect to pick up the additional ungrazed plant heights. In some cases it may be necessary to select, in a subjective manner, ungrazed plants on an adjacent area to determine average ungrazed plant height.

(e) Use only one kind of plant. When 80 percent or more of the plants measured produce culms or when 80 percent or more are without culms, the remaining 20 percent or less may be disregarded without great error.

(f) When a combination occurs with 80 percent or more culm-producing plants, and a plant lacking culms is encountered nearest the sampling point, measure the nearest culm-producing plant of the species. Corresponding procedure should be followed when the kind of plant selected is without culms and a culm-producing plant is encountered. These two combinations are those most commonly encountered in the field.

(g) When approximately equal numbers of culm and culmless plants occur, measure plants of both kinds. The measurements for the plants with culms should be marked or kept separate on the form. Due precautions are necessary to use appropriate ungrazed heights and the correct utilization scales for plants with and without culms.

g. Calculating Percent Utilization. Calculate the percent utilization as follows:

(1) Divide the total of the ungrazed plant heights by the number of ungrazed plants sampled to calculate the average ungrazed plant height.

(2) Calculate the percent utilization of individual sampled plants of the key species with the gauge by using the "Average Ungrazed Height" and the height of the sampled plant. The sliding card in the gauge is pulled out of the envelope until the utilization scale for the key species appears in the window. The dial is then turned so that the number representing the previously calculated average ungrazed height is set at the arrow designated "Average Ungrazed Height". The percent utilization may then be read on the scale in the window opposite the number on the dial representing the measured stubble-height of the sampled plant. The utilization scale on the sliding card must fit the species being sampled. (See Section 5.24h.) Use the culmless curve for the key species when utilization studies are conducted on early growth of the plants.

(3) Calculate the average utilization for a key species by totaling the percent utilization for the individual sampled plants and dividing by the number of sampled plants of that species.

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(4) Record the average height of ungrazed plants, percent utilization of individual sampled plants, and average percent utilization for the key species on the Utilization Study Data - Height-Weight Method Form. (See Illustration 5.)

h. Preparing Utilization Scales. Utilization scales used with the utilization gauge are prepared from height-weight curves developed for individual grass and grasslike species. Previously prepared utilization scales must be checked to see whether or not these scales fit the species on the rangeland where they will be used. (See Illustration 6, pages 2 and 3.) Where existing utilization scales do not fit, new scales will have to be prepared. Scales for a number of species are included on the same card.

(1) Developing Height-Weight Curves. Develop height-weight curves by collecting plants of a given species and determining the height-weight relationship for that species. The curve for any given species must be checked for variation between range sites and climatic regions. It is necessary to develop separate curves for culm-producing plants and culmless plants when a species only sporadically produces culms.

(a) Sampling Plants. Sample at least ten plants of a given species. Select only those plants which have reached maximum growth.

i. At each interval along a pace transect, choose the ungrazed plant of the given species nearest the toe. Use one square inch as a unit area for sod-forming species and a comparable number of stems as a unit area for single stem species.

ii. Remove all old leaves and stems of previous year's growth.

iii. Clip the plant to within 1/4 inch of the ground.

iv. Wrap the clipped plant with thread from base to top to retain all leaves and culms in their natural position.

v. Separate the plants with culms from plants without culms and consider each as a separate sample.

vi. Measure heights of clipped plants to the nearest inch and determine the average height.

vii. Calculate the number of plants that must be sampled to determine mean height with a standard error of  $\pm 3$  to 5 percent at the 95 percent confidence level (Barrett and Nutt 1979, Freese 1962).

viii. Sample additional plants, if necessary.

ix. Measure the maximum height of each plant.

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x. Clip the top 10 percent by height of each plant and place the clippings in a paper sack labeled 0 to 10 percent. Clip additional height segments in 10 percent increments and place clippings in appropriately labeled sacks--11 to 20 percent, 21 to 30 percent, 31 to 40 percent, 41 to 50 percent, 51 to 60 percent, 61 to 70 percent, 71 to 80 percent, 81 to 90 percent, and 91 to 100 percent. A large paper trimmer with a guide to hold the plants in their proper position on the platform may be used to clip plants into segments. Label the sacks to show species, date, and location. Place a given height segment for all plants of a species collected in one paper sack.

xi. Dry the clippings until a constant weight, to the nearest tenth of a gram, is achieved. Leave clippings in the paper sacks for drying.

(b) Determining Height-Weight Relationships.

i. Weigh and record the weights for each of the ten height segments to the nearest tenth of a gram. Subtract sack weight before recording the dry weights of each height segment. (See Illustration 7.)

ii. Total the dry weights of the ten height segments and record the total dry weight of the collected plants. (See Illustration 7.)

iii. Record the cumulative weight for each segment. This includes the weight of the segment plus the weights of all preceding segments starting from the top of the plant. (See Illustration 7.)

iv. Calculate the cumulative percent weight removed at each height segment by dividing the cumulative weight for each segment by the total weight and multiplying by 100. (See Illustration 7.)

v. Plot the cumulative percent height removed against the cumulative percent weight removed on graph paper. The resulting curve portrays the height removed-weight removed relationship for the species. (See Illustrations 7 and 8.)

(2) Transferring Data from Curves to Scales. Transfer the height-weight relationship data portrayed on the height-weight curve to a utilization scale for use in the utilization gauge.

(a) Turn the dial on the utilization gauge so that 10 inches is set at the arrow designated "Average Ungrazed Height." With the dial set at 10, each inch increment from 9 to 0 on the dial represents 10 percent of the height. (See Illustration 9.)

(b) Slide a blank card into the utilization gauge.

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(c) Use the height-weight curve to determine the percent height that would be removed when 10 percent, 15 percent, through 95 to 98 percent of the weight is removed. (See Illustrations 8 and 9.)

(d) Enter 10 percent, 15 percent through 95 to 98 percent weight removed on the scale in the window of the utilization gauge across from the point on the dial representing the corresponding percent height removed. With the dial set at 10 inches for "Average Ungrazed Height," the percent removed can easily be converted to inches removed. (See Illustration 9.)

(3) Documenting Scale Preparation. For each utilization scale prepared, maintain a record of the species, the data used to prepare the scale, the date the scale was prepared, and the areas of applicability.

5.25 ACTUAL WEIGHT METHOD. The Actual Weight Method involves the separate clipping and weighing of grazed and ungrazed plants along a transect. The difference between weights represents the amount of forage consumed by animals or otherwise destroyed during the period of use.

a. Areas of Use. The method is best adapted to clearly defined growth forms such as bunchgrasses. It is not recommended for areas where shrubs or rhizomatous plants are the key species. It can be used on sod-forming grasses if a small plot, 2 or 3 inches square, is used to delineate a unit.

b. Advantages and Limitations. The method is simple and accurate. It is restricted in use primarily to bunch and sod-forming grasses.

c. Equipment.

(1) Study Location and Documentation Data Form. (See Illustration 1.)

(2) Utilization Study Data - Actual Weight Method Form. (See Illustration 10.)

(3) Frames to delineate plots (if necessary).

(4) Clipping shears.

(5) Paper sacks.

(6) Spring scale, calibrated in grams.

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d. Training. Little training is required for this method. Examiners must be able to identify the plant species. Training is limited to clipping and weighing grazed and ungrazed plants and recording the weights. (See Section 3, this Reference, and Section 4, Technical Reference 4400-1.)

e. Establishing Studies. Select key area(s) and key species and determine the number, length, and location of the transects. (See Section 3, this Reference, and Section 5, Technical Reference 4400-1.) Document the location and other pertinent information concerning a transect on the Study Location and Documentation Data Form. (See Illustration 1, this Reference, and Section 6, Technical Reference 4400-1.)

f. Sampling Process. After examiners are trained, proceed with the collection of utilization data.

(1) Select two paper sacks for each key species; one is marked "grazed" and the other "ungrazed."

(2) At each interval along the transect, clip the plant of the key species nearest the toe to ground level. Collection of grazed and ungrazed plants as they occur along the transect is extremely important. Only the plants collected along the transect are used in calculating utilization.

(3) Place the plant, grazed or ungrazed, in the respective sack and mark a tally on the outside of the sack or on a tally sheet. For example, a grazed plant is clipped and placed in the sack marked "grazed". The tally is made so the number of plants in each sack is known.

(4) Clip plants along the transect until there are at least 25 plants (or some other predetermined number) in each of the grazed and ungrazed sacks. Do not discontinue clipping one kind (grazed or ungrazed) of plant when extending the transect to satisfy the minimum quota for the other kind of plant. The grazed and ungrazed sacks may not contain the same number of plants. (For example, if the grazed sack contains 25 plants and the ungrazed sack contains 20 plants, continue to clip grazed and ungrazed plants encountered along the transect until the ungrazed sack contains 25 plants. In this example the grazed sack will probably contain more than 25 plants when the minimum quota of ungrazed plants is met.)

(5) Determine the number of grazed and ungrazed plants that were clipped.

(6) Weigh each sack separately to determine the weights of the grazed and ungrazed plants.

(7) Record the numbers and weights on the Utilization Study Data - Actual Weight Method Form. (See Illustration 10.)

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(8) If sufficient ungrazed plants cannot be found on the key area, clip ungrazed plants along a transect in an adjoining area, in an ungrazed pasture within the allotment, or in another ungrazed area in the vicinity to obtain the average weight of ungrazed plants. These sites must be as similar as possible (vegetation type, soil, etc.) to the area in which the study is being conducted.

g. Calculating Percent Utilization. Calculate the percent utilization as follows:

(1) Step 1. Calculate the average weight of ungrazed plants.

$$\frac{\text{Total weight of ungrazed plants}}{\text{Total number of ungrazed plants}} = \text{Average weight of ungrazed plants}$$

(2) Step 2. Calculate the total weight of all clipped plants as if none had been grazed.

$$\begin{array}{l} \text{Total number of plants} \\ \text{clipped (both grazed} \\ \text{and ungrazed)} \end{array} \times \begin{array}{l} \text{Average weight} \\ \text{of ungrazed} \\ \text{plants} \end{array} = \begin{array}{l} \text{Total weight of all} \\ \text{clipped plants as if} \\ \text{none had been grazed} \end{array}$$

(3) Step 3. Calculate the percent of total production (weight) remaining.

$$\frac{\begin{array}{l} \text{Total weight of clipped plants} \\ \text{(grazed and ungrazed)} \end{array}}{\begin{array}{l} \text{Total weight of all clipped} \\ \text{plants as if none had been grazed} \end{array}} \times 100 = \begin{array}{l} \text{Percent of total} \\ \text{production (weight)} \\ \text{remaining} \end{array}$$

(4) Step 4. Calculate the percent utilized.

$$100\% - \begin{array}{l} \text{Percent of total} \\ \text{production (weight)} \\ \text{remaining} \end{array} = \text{Percent Utilized}$$

(5) Step 5. Record the percent utilization on the Utilization Study Data - Actual Weight Method Form. (See Illustration 10.)

5.26 STEM COUNT METHOD. The Stem Count Method involves counting grazed and ungrazed stems in plots along a transect. It is based on the theory that percent utilization is directly related to the total number of stems grazed.

## RANGELAND MONITORING - UTILIZATION STUDIES

a. Areas of Use. This method was developed for use on mixed grass prairie rangelands. It is recommended for rangelands where western wheatgrass (*Agropyron smithii*) or other single-stem rhizomatous grasses are the important forage species. If the key species is not present at the proper interval at least 50 percent of the time, a different method for determining utilization should be used.

b. Advantages and Limitations. The method is simple and comparatively free from personal or procedural error. Some problem may arise in determining what is a single plant when more than one stem appears from a rhizome. Count stems--not plants.

c. Equipment.

(1) Study Location and Documentation Data Form. (See Illustration 1.)

(2) Utilization Study Data - Stem Count Method Form. (See Illustration 11.)

(3) Frame to delineate plots (a one-square-foot plot is suggested).

d. Training. Little training is required for this method. Examiners must be able to identify the plant species. Examiners count and record the number of grazed and ungrazed stems of the grasses on the plots. (See Section 3, this Reference, and Section 4, Technical Reference 4400-1.)

e. Establishing Studies. Select key area(s) and key species and determine the number, length, and location of the transects. (See Section 3, this Reference, and Section 5, Technical Reference 4400-1.) Document the location and other pertinent information concerning a transect on the Study Location and Documentation Data Form. (See Illustration 1, this Reference, and Section 6, Technical Reference 4400-1.)

f. Sampling Process. After examiners are trained, proceed with the collection of utilization data.

(1) At each interval along the transect, place the frame immediately in front of the toe or on the nearest site having the key species.

(2) Count all grazed and ungrazed stems of the key species in each plot and record the numbers separately on the Utilization Study Data - Stem Count Method Form. (See Illustration 11.)

g. Calculating Percent Utilization. Calculate the percent utilization (percent of stems grazed) by dividing the total number of grazed stems by the total number of stems (grazed plus ungrazed) and multiplying the result by 100. Record the percent utilization on the Utilization Study Data - Stem Count Method Form. (See Illustration 11.)

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5.27 GRAZED-CLASS METHOD. The Grazed-Class Method uses photo guides of key species to make utilization estimates along a transect. These estimates reflect herbage removed but also show herbage remaining.

a. Areas of Use. This method is adapted for use on perennial grass, perennial grass-forb, and grass-shrub rangelands where the key species are either bunch or rhizomatous/sod-forming grass or grasslike species. It is designed for use after the plants have made full seasonal growth.

## b. Advantages and Limitations.

(1) This method is rapid and easy to learn and use. It can be used by livestock operators and examiners to give consistent and accurate estimates of utilization. Errors in judgment are compensating and the mathematics involved are simple. In poor growth years when plants do not mature, the guides will not distinguish between use and no-growth.

(2) The difficult job is the development of photo guides based on average plants on a typical site that have a good photo-height-weight fit. One guide, properly developed for a given species and a typical site, can be used on all sites over a fairly broad area (e.g., the south-west) in good and bad production years without serious error. The guides serve as standards of comparison which promote consistency in estimates and facilitate estimation of irregular use of plants.

## c. Equipment.

(1) Study Location and Documentation Data Form. (See Illustration 1.)

(2) Utilization Study Data - Grazed-Class Method Form. (See Illustration 12.)

(3) Photo guides. (See Illustration 13.)

(4) Tally counter (optional).

(5) Additional equipment needed to develop photo guides.

(a) Clipping shears.

(b) Paper sacks.

(c) Scale calibrated in tenths of grams.

(d) Graph paper.

d. Training. Minimal training of examiners is needed to use this method. Examiners must be able to identify the plant species. The major problem with inexperienced examiners, and examiners who have not used the method for some time, is underestimation of use on heavier grazed plants. (See Section 3, this Reference, and Section 4, Technical Reference 4400-1.)

e. Establishing Studies. Select key area(s) and key species and determine the number, length, and location of the transects. (See Section 3, this Reference, and Section 5, Technical Reference 4400-1.) Document the location and other pertinent information concerning a transect on the Study Location and Documentation Data Form. (See Illustration 1, this Reference, and Section 6, Technical Reference 4400-1.)

f. Sampling Process. After examiners are trained, proceed with the collection of utilization data.

(1) At each interval along the transect, select the plant(s) of the key species (seedlings excepted) nearest the toe.

(2) Compare the sample plant(s) with the photo guides for that species and classify according to one of six grazed-classes representing 0, 10, 30, 50, 70, or 90 percent use. (See Illustration 13.)

(3) Base the estimates of utilization on growth form of the plant. Variations in height growth due to site characteristics and seasonal precipitation can be disregarded since variations in height are automatically adjusted for by the eye.

(4) Record the estimates by dot count for each grazed class on the Utilization Study Data - Grazed-Class Method Form. (See Illustration 12.)

(5) For bunchy key species, make estimates on individual plants.

(6) For rhizomatous/sod-forming key species, make estimates on 6-, 8-, 10-, or 12-inch square plots along the transect.

g. Calculating Percent Utilization. Calculate the percent utilization as follows:

(1) Convert the dot count to the number of plants sampled by grazed-class.

(2) Multiply the number of plants sampled in each grazed-class times the grazed-class percent.

(3) Total the products for all classes.

(4) Divide the sum by the total number of samples on the transect.

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(5) Record the average percent utilization on the Utilization Study Data - Grazed-Class Method Form. (See Illustration 12.)

h. **Developing Photo Guides.** Photo guides must be developed that have a close fit between the grazed-class percentages of the guide and the height-weight curve of the plant photographed. Guides are developed as follows:

(1) When plants of a given species have reached full growth, sample 5 to 10 representative plants from a typical site. For bunchy species, sample individual plants. For rhizomatous/sod-forming species, sample plants from a 6-, 8-, 10-, or 12-inch square plot.

(2) Beginning at the top of the plant, clip 4- to 10-inch segments from the top portion and 2-inch segments from the lower portion of each plant. Place each segment in an individual paper sack. Label the sacks to show species, plant number, segment number, segment length, date, and location. Keep the clippings from each plant separate. Make all height measurements from the base of the plant. (See Illustration 14.)

(3) Oven dry and carefully weigh each plant segment to the nearest tenth of a gram. Subtract sack weight before recording the dry weight of each segment. (See Illustration 14.)

(4) Beginning at the top of the plant, record the cumulative dry weight for each segment. This includes the weight of the segment plus the weights of all preceding segments. (See Illustration 14.)

(5) Calculate the cumulative percent weight for each segment by dividing the cumulative dry weight for each segment by the total dry weight and multiplying the result by 100. (See Illustration 14.)

(6) Beginning at the base of each plant, record the cumulative height remaining by segment. This includes the combined length of all preceding segments. (See Illustration 14.)

(7) Determine the average height of the clipped plants.

(8) Adjust the height remaining of each individual plant to average plant-height remaining with the following formula:

$$\begin{array}{l} \text{Adjusted} \\ \text{individual} \\ \text{plant-height} \\ \text{remaining} \end{array} = \frac{\text{Total height of average plant}}{\text{Total height of individual plant}} \times \begin{array}{l} \text{Height} \\ \text{remaining of} \\ \text{individual} \\ \text{plant} \end{array}$$

(9) Plot the cumulative percent weight of the individual plants against the adjusted individual plant-height remaining on graph paper. (See Illustration 15.) Use the lower left hand corner as zero on both scales and plot 5 or 6 clipped plants of a given species on the same graph.

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(10) Determine the average plant height for the six grazed-class percentages (percent weight removed), 0, 10, 30, 50, 70 and 90 percent, from the height-weight curves on the graph. (See Illustration 15.)

(11) Return to the field and select 4 to 6 average plants to be used in making a photo guide for the given species. Use the grazed-class heights read from the average curve on the graph to determine the heights at which to clip the plants to be photographed using the formula:

$$\begin{array}{l} \text{Clipping height} \\ \text{of plant to be} \\ \text{photographed} \end{array} = \frac{\text{Total height of plant to be photographed}}{\text{Total height of average plant}} \times \begin{array}{l} \text{Grazed-class} \\ \text{height of} \\ \text{average} \\ \text{plant} \end{array}$$

(12) Photograph each plant in sequence at the unclipped height and at heights representing 10, 30, 50, 70 and 90 percent weight removed. Clip the last increment to ground level.

(13) Sack the clippings separately and dry them in an oven. Label the sacks to show species, plant number, clipped height, grazed-class percentage, date and location.

(14) Determine if the curve of at least one of the photographed plants closely matches the average curve on the graph. In addition, determine if the cumulative weight percentages for the various clipped heights of that plant closely match the grazed-class percentages (within 2 or 3 percentage points). If a close match is obtained, trim the photos and photograph on a grazed-class photo guide background. (See Illustration 13.) If not, repeat the photographing of average plants until a close fit is obtained.

(15) For each photo guide prepared, maintain a record of the species, the data used to prepare the guide, the date the guide was prepared, and the areas of applicability.

5.3 Methods for Browse Species. In addition to the methods described in this section, the Paired Plot and Key Forage Plant Methods described in Sections 5.21 and 5.23, respectively, can also be used for browse species.

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5.31 TWIG LENGTH MEASUREMENT METHOD. Under the Twig Length Measurement Method, utilization is determined by measuring twigs on 25 to 50 browse plants after full annual growth has occurred and again after the period of use. The difference between the two measurements is the amount of browse that has been utilized. Separate transects are run for different browse species.

a. Areas of Use. This method of determining utilization is restricted to use on browse species which clearly exhibit annual twig growth, such as bitterbrush and mountain mahogany.

b. Advantages and Limitations.

(1) Percent utilization determined by measurement is more accurate than when determined by estimation. This method is useful in determining the amount of use made on browse plants by livestock and the amount of use made on the same browse plants by wildlife, wild horses, and/or wild burros. The degree of direct forage competition among different kinds of animals can be determined where there are discrete periods of use by the different animals. Growth and use indexes can also be determined.

(2) Good utilization estimates can be obtained with this method even though twig volume is not uniformly distributed along the length of twigs. The results will vary with species due to twig growth characteristics. The method is not reliable on species which do not clearly exhibit annual twig growth, such as sagebrush and serviceberry. It is also not reliable in areas of the southwest where annual twig growth may be masked by almost continuous growth or erratic seasonal growth after rains.

(3) Time and expense needed for gathering data are doubled because the measurements must be made twice a year.

c. Equipment.

(1) Study Location and Documentation Data Form. (See Illustration 1.)

(2) Utilization Study Data - Twig Length Measurement Method Form. (See Illustration 16.)

(3) Twenty-five to 50 numbered metal tags.

(4) Roll of soft copper or aluminum wire.

(5) Six-inch and 12-inch rulers.

(6) Compass.

(7) Steel post.

(8) Post driver.

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d. Training. This method does not require intensive training for field application. Examiners must be able to identify the plant species and recognize annual twig growth on the selected key species. (See Section 3, this Reference, and Section 4, Technical Reference 4400-1.)

e. Establishing Studies. Select key area(s) and key species and determine the number, length, and location of the transects. (See Section 3, this Reference, and Section 5, Technical Reference 4400-1.)

(1) In mixed stands of key browse, such as bitterbrush and mountain mahogany, establish separate transects for each species.

(2) Permanently locate transects by means of a reference post placed near the beginning of the transect. An alternative is to select a reference point, such as a prominent natural feature, and give the bearing and distance to the beginning of the transect. If a post is used, it should be tagged to indicate that it marks the location of a monitoring study established by the Bureau of Land Management.

(3) At the beginning of each transect, determine the transect bearing and select a prominent distant landmark such as a large tree, rocky point, etc., that can be used as the transect bearing point.

(4) Plot the transects on detailed allotment maps and/or aerial photos.

(5) Document the location and other pertinent information concerning a transect on the Study Location and Documentation Data Form. (See Illustration 1, this Reference, and Section 6, Technical Reference 4400-1.)

f. Sampling Process. After examiners are trained and are confident in their ability to recognize annual twig growth on the key species, proceed with the collection of utilization data.

(1) Tag plants of only one species per transect.

(2) Tag 25 to 50 plants of the selected key species on each transect.

(3) Objectively tag plants along the transect. The first tagged plant is ten paces from the beginning point of the transect along the transect bearing. The distance between tagged plants, thereafter, should be at least five paces.

(4) At the end of each pacing interval, select and tag the closest plant of the key species within a 180 degree zone ahead of the examiner. (See Illustration 18 for a schematic of the 180 degree selection zone.)

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(5) Attach a numbered metal tag to an individual branch of the selected browse plant with soft copper or aluminum wire. The wire should be loosely attached on the branch to allow for future growth. There should be a minimum of 10 twigs with new growth between the point of the tag and the end of the branch. Only one tag per plant is needed.

(6) Measure the length of current growth (to the nearest 1/2 inch or nearest centimeter) on all twigs from the point of tag attachment to the end of the branch. Record the data on the Utilization Study Data - Twig Length Measurement Method Form. (See Illustration 16.)

(a) Make the first measurements after plants of the selected key species have attained full annual growth.

(b) Make subsequent measurements after the period of use.

(7) Where use of tagged plants occurs prior to completion of full annual growth, estimate the use and enter the percentage by plant on the Utilization Study Data - Twig Length Measurement Method Form. (See Illustration 16.)

(8) Face the transect bearing point and begin the next pacing interval from the last tagged plant.

g. Calculations. Calculations can be made on the back of the Utilization Study Data - Twig Length Measurement Method Form. (See Illustration 16.)

(1) Average Estimated Use Prior to Completion of Full Annual Growth. Determine the average estimated use made prior to completion of full annual growth by totaling the estimated percent utilization for the individual plants and dividing the total by the number of tagged plants.

(2) Percent Utilization. Calculate the percent utilization as follows:

(a) Total the twig measurements made after completion of full annual growth for each tagged plant.

(b) Total the twig measurements made after the period of use for each tagged plant.

(c) Calculate percent utilization of individual tagged plants as follows:

$$\frac{\text{Total twig length by plant after full annual growth} - \text{Total twig length by plant after period of use}}{\text{Total twig length by plant after full annual growth}} \times 100 = \text{Percent utilization}$$

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(d) Calculate the average percent utilization for the key species on the transect by totaling the percent utilization for the individual tagged plants and dividing the total by the number of tagged plants. The average percent utilization may also be calculated as follows:

$$\frac{\text{Total twig length for all tagged plants after full annual growth} - \text{Total twig length for all plants after period of use}}{\text{Total twig length for all tagged plants after full annual growth}} \times 100 = \text{Average percent utilization}$$

(e) Determine the total percent utilization by adding the average estimated use prior to completion of full annual growth and the average percent utilization for the period(s) of use.

## (3) Growth Index.

(a) The growth index is the average twig length for all tagged plants as determined from the measurements obtained after completion of full annual growth. This index can be used to compare the amounts of growth which occur in different years and as an indication of species vigor.

(b) Calculate the growth index as follows:

$$\frac{\text{Total twig length for all tagged plants after full annual growth}}{\text{No. of twigs measured}} = \text{Growth index (Average twig length)}$$

(c) If use occurred on the plants prior to measurement after completion of full annual growth, adjust the growth index to account for this use as follows:

$$\frac{\text{Growth index (Average twig length)}}{100\% - \text{Average estimated use prior to completion of full annual growth}} \times 100 = \text{Adjusted growth index}$$

## (4) Use Index.

(a) The use index is an indication of the volume of browse removed. This index can be used to compare the amounts of browse removed in different years.

(b) Calculate the use index by multiplying the total percent utilization times the adjusted growth index and dividing by 100. For example, if total utilization is 50 percent and the adjusted growth index is 6 inches, the use index is 3. If total utilization is 50 percent and the adjusted growth index is 3 inches, the use index is 1.5. Although utilization is the same in both examples, twice as much browse was removed in the first example.

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5.32 COLE BROWSE METHOD. Under the Cole Browse Method, a transect is run to collect data on 25 to 50 plants of a browse species. This method provides data on age and form classes, availability and hedging, estimated utilization, and growth and use indexes for the browse component of the plant community. These data are used to make annual utilization and trend estimates. Separate transects are run for different browse species.

a. Areas of Use. This method can be used in a wide variety of vegetation types where browse key species clearly exhibit annual leader growth.

b. Advantages and Limitations. The Cole Browse Method is more rapid than methods that require measurements; however, it is somewhat less accurate because estimates rather than measurements are used to determine utilization. There can be considerable variation in utilization estimates as well as in age and form class estimates among examiners. Plant growth characteristics, weather conditions, and site conditions may have an equal or greater influence on the appearance of plants than leader use. In addition, age class and form class may not always be sensitive indicators of the effects of browsing.

c. Equipment.

- (1) Study Location and Documentation Data Form. (See Illustration 1.)
- (2) Utilization Study Data - Cole Browse Method Form. (See Illustration 17.)
- (3) Compass.
- (4) Ten-foot tape.
- (5) Steel posts.
- (6) Post driver.
- (7) Six-inch and 12-inch rulers.

d. Training. The accuracy of utilization percentage estimates is dependent upon thoroughness of training and ability of examiners to identify plant species and to estimate amount of use. Examiners must be able to recognize annual leader growth on key species, availability of browse for use by animals, the three degrees of hedging, and the age classes of browse plants. (See Section 3, this Reference, and Section 4, Technical Reference 4400-1.)

e. Establishing Studies. Select key area(s) and key species and determine the number, length, and location of the transects. (See Section 3, this Reference, and Section 5, Technical Reference 4400-1.)

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(1) Establish permanent transects for sampling the selected key species. Sample only one species on each transect.

(2) Select the plant of the key species which will be the first plant sampled and from which the transect will begin.

(3) Stand at the edge of the selected browse plant and face the direction the transect will run. Select a prominent distant landmark such as a large tree, rocky point, etc., that can be used as the transect bearing point.

(4) Drive steel posts at intervals of 5 and 10 feet behind the selected browse plant, such that the posts, the selected browse plant, and the transect bearing point are all in line. (See Illustration 18.)

(5) Tag the post located farthest (10 feet) from the selected browse plant to indicate that it marks the location of a monitoring study established by the Bureau of Land Management.

(6) Plot the transects on detailed allotment maps and/or aerial photos.

(7) Document the location and other pertinent information concerning a transect on the Study Location and Documentation Data Form. (See Illustration 1, this Reference and Section 6, Technical Reference 4400-1.)

(8) Temporary transects may be used for locating key areas or for gathering data on browse stands outside key areas. These transects are not marked on the ground.

f. Sampling Process. After examiners are trained and are confident in their ability to recognize annual leader growth, availability of browse, degree of utilization, degree of hedging, and age class of browse plants, proceed with the collection of data.

(1) Collecting Data. Beginning with the first selected plant, make the necessary observations, estimates, and measurements and record the data on the Utilization Study Data - Cole Browse Method Form. (See Illustration 17.)

(a) Form Class. Observe the selected plant and check the appropriate Form Class Column on the form.

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i. The form classes are as follows:

No.	Form Class
1	All available, little or no hedging
2	All available, moderately hedged
3	All available, severely hedged
4	Partially available, little or no hedging
5	Partially available, moderately hedged
6	Partially available, severely hedged
7	Unavailable
8	Dead

ii. Availability refers to browse available to the animals.

iii. The three degrees of hedging are based on the length and appearance of two-year-old wood (previous year's leaders) immediately below the current leaders. (See Illustration 19.) If more than one degree of hedging is evident on a plant, form class is based on the predominant or average condition. The three degrees of hedging are:

Little or no hedging	-	Two-year-old wood is relatively long and unaltered or only slightly altered.
Moderately hedged	-	Two-year-old wood is fairly long but most of it has been altered from the normal growth form.
Severely hedged	-	Two-year-old wood is relatively short and/or strongly altered from the normal growth form.

iv. Browse plants are considered to reflect the normal growth form when less than 50 percent of the two-year-old growth (the previous year's leaders) has clipped ends and a majority of the current leaders extend directly from terminal buds off two-year-old wood. Alterations from the normal growth form are reflected when 50 percent or more of the two-year-old wood has clipped ends. Current leaders occur mostly as extensions from lateral buds off two-year-old wood in the moderately hedged condition or as clumped lateral and/or adventitious sprouts in the severely hedged condition.

v. The length of two-year-old wood reflects the relative vigor of the previous year's leader growth and/or the effects of prior use. Since the degrees of hedging are confined to two-year-old wood, they reflect the effects of use during a previous year, or a succession of previous years.

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vi. The three degrees of hedging provide a measure of the relative condition of browse plants and assess short-term effects of different intensities of leader use.

(b) Age Class. Age class data reflect the establishment, survival, and decadence of key browse plants. Observe the selected plant and check the appropriate Age Class Column on the form. An age class assignment is not made for sample plants in form classes 7 and 8. The four age classes are:

- S - Seedling - New plants that have survived at least one growing season, but are not more than two or three years old. The basal stems are generally 1/8 inch or less in diameter.
- Y - Young - Young plants usually less than 10 years old. Elongated growth form and simple branching with basal stems no greater than approximately 1/2 inch in diameter.
- M - Mature - Plants more than 10 years old. Distinguished by heavier, often gnarled stems, and complex branching. Canopy made up of more than 50 percent living wood. Basal stems are often greater than 1/2 inch in diameter.
- D - Decadent - Browse plants with more than 50 percent of the canopy area dead.

(c) Leader Use Estimates. Leader use is an estimate of the intensity of use on browse plants available to the animals. Estimate the percent of available leaders that have been browsed on each sample plant. This estimate is based on the number of leaders that have been browsed and not on the percent of growth removed. Leader use estimates are not made for sample plants in form classes 7 and 8. Determine the use class that the estimate falls in and enter the class value in the Leader Use Column on the form. For example, if estimated leader use is 15 percent, then the recorded value will be 25 percent; if estimated use is 80 percent, the recorded value will be 75 percent. The leader use class percentage ranges and the corresponding class values are:

Leader Use Class Percentage Range	Class Values (%)
0	0
1-10	5
11-40	25
41-60	50
61-90	75
91-100	95

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(d) Leader Length Measurements. Measure current growth on the ungrazed leaders on the available portion of each sampled plant on the transect. These measurements are taken to determine the average annual growth or growth index. Record these measurements (to the nearest 1/2 inch or nearest centimeter) on the back of the form.

(2) Selecting the Nearest Plant. Stand at the edge of the sampled plant and face toward the transect bearing point. Select and sample the nearest plant of the key species that occurs within a 180 degree zone. (See Illustration 18.) Repeat this routine until 25 to 50 plants have been sampled.

(3) Modifying the Transect for Dense Browse Stands. The transect should be long enough to cross the key area being sampled. In dense browse stands, the distance traveled on a 25- to 50-plant transect will be very short. To lengthen a transect, stand at the edge of the plant at the beginning of the transect and pace off some desired distance (5 paces, 20 paces, etc.) in the direction of the transect bearing point. At the end of the pacing interval, select the nearest plant in the 180 degree zone. Use the same pacing interval throughout the transect.

g. Calculations. Make the calculations and record the results in the appropriate column or blank on the Utilization Study Data - Cole Browse Method Form. (See Illustration 17.)

(1) Form Class Summary. Total the number of plants in each form class and enter the value in the Total Column on the form. Calculate the percent composition by form class as follows:

$$\frac{\text{Total no. of plants in a form class}}{\text{Total no. of plants sampled}} \times 100 = \text{Percent composition by form class}$$

Enter the value in the Percent Column on the form.

(2) Age Class Summary. Total the number of plants in each age class and enter the value in the Total Column on the form. Calculate percent composition by age class as follows:

$$\frac{\text{Total no. of plants in age class}}{\text{Total no. of plants sampled}} \times 100 = \text{Percent composition by age class}$$

Enter the value in the Percent Column on the form.

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(3) Average Leader Use. Calculate the average leader use as follows:

$$\frac{\text{Total estimated leader use for all plants}}{\text{Total no. of plants sampled}} = \text{Average leader use (\%)}$$

Record the value on the form.

(4) Average Leader Length or Growth Index.

(a) The growth index is the average length of the ungrazed leaders on the sampled plants. This index can be used to compare the amounts of growth which occur in different years and as an indication of species vigor.

(b) Calculate the average leader length or growth index as follows:

$$\frac{\text{Total length of ungrazed leaders}}{\text{Total no. of leaders measured}} = \frac{\text{Average length of ungrazed leaders or growth index}}{\text{growth index}}$$

Record the value on the form.

(5) Use Index.

(a) The use index is an indication of the volume of browse removed. This index can be used to compare amounts of browse removed in different years.

(b) Calculate the use index by multiplying the average leader use (%) times the average leader length (growth index) and dividing by 100. Record the use index on the form. For example, if average leader use is 50 percent and the average leader length is 6 inches, the use index is 3. If average leader use is 50 percent and the average leader length is 3 inches, the use index is 1.5. Although utilization is the same in both examples, twice as much browse was removed in the first example.

5.33 EXTENSIVE BROWSE METHOD. Under the Extensive Browse Method, a 100-point pace transect is run to collect vegetation data. This method provides data on utilization, species composition, age classes, form classes, availability, and hedging for the browse component of the plant community.

a. Areas of Use. This method can be used within a wide variety of vegetation types.

## RANGELAND MONITORING - UTILIZATION STUDIES

b. Advantages and Limitations. The Extensive Browse Method is rapid and can be used on all browse species. It is well adapted to situations where browse data must be obtained from large areas with limited personnel. All browse species within the plant community can be sampled on one transect. The method is more rapid than methods which require measurements. However, it is somewhat less accurate than measurement methods in determining utilization because estimates rather than measurements are used. This method is designed to eliminate personal bias and keep consistency at a maximum.

c. Equipment.

(1) Study Location and Documentation Data Form. (See Illustration 1.)

(2) Utilization Study Data - Extensive Browse Method Form. (See Illustration 20.)

(3) Tally counter (optional).

d. Training. The accuracy of utilization percentage estimates is dependent on thoroughness of training and ability of examiners to identify the plant species and to estimate amount of use. Examiners must be able to recognize the availability of browse for use by animals, the three degrees of hedging, and the age classes of browse plants. (See Section 3, this Reference, and Section 4, Technical Reference 4400-1.)

e. Establishing Studies. Select key area(s) and key species and determine the number, length, and location of the transects. (See Section 3, this Reference, and Section 5, Technical Reference 4400-1.)

(1) Locate the "heaviest used" or "representative" areas in an allotment. The intent is to find several areas used intensively during the period of use. These may occur in the same general location each year, but will probably fluctuate. Transects are located in heavy use areas since vegetation changes which occur as a result of browsing will be evident first on these areas.

(2) Place the transects in the areas selected for that year. Do not establish permanent transects because the area(s) selected for sampling may change from year to year.

(3) Select a transect starting point and a transect bearing point, such as a prominent natural feature, to help maintain the intended line of travel.

(4) Although transects are not permanent, plot them on detailed allotment maps and/or aerial photos for documentation and future reference.

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(5) Record the documentation under "Notes" on the Utilization Study Data - Extensive Browse Method Form, or on the Study Location and Documentation Data Form. (See Illustrations 1 and 20.)

f. Sampling Process. After examiners are trained and are confident in their ability to recognize availability of browse, degree of utilization, degree of hedging, and age classes of browse plants, proceed with the collection of data.

## (1) Selecting the Sample Plants.

(a) At the end of each pacing interval, face toward the transect bearing point, select and sample the nearest browse plant that occurs within a 180 degree zone. (See Illustration 18 for a schematic of the 180 degree selection zone.)

(b) Begin each pacing interval from the last sampled plant. Pace toward the transect bearing point in the interspaces between browse plants. It is not necessary to pace in an absolutely straight line.

(2) Collecting Data. Make observations and estimates on the selected browse plant, and record the data by species on the Utilization Study Data - Extensive Browse Method Form. (See Illustration 20.) Use a dot count or tally counter to keep track of the number of plants sampled.

(a) Utilization. Select a branch on the sample browse plant and estimate the amount of utilization of current annual growth.

i. Select a branch at random. For example,

(i) Note the second hand location or the digital seconds readout on a watch.

(ii) Using the route of travel along the transect line as the 6 o'clock - 12 o'clock line, go to the position on the browse plant that is indicated by the location of the second hand or the digital second readout. (Example - 20 seconds represents the 4 o'clock position.)

(iii) Select an available branch on that side of the plant.

ii. Count down ten leaders of annual growth and determine the number of these leaders which show any evidence of use. Convert this number to percent (i.e., two leaders used equals 20 percent use; six leaders used equals 60 percent use, etc.). Record the value by dot tally in the appropriate column on the form.

iii. After sampling the plant at the 50th point, figure the average utilization for each species encountered on the first half of the transect. Circle the plant code for all species averaging  $\geq 50$  percent use at this point. (See Section 5.33g(1).)

## RANGELAND MONITORING - UTILIZATION STUDIES

## iv. Sample points 51-100 as follows:

(i) If the selected plant is one of the circled species, record the data in the same manner as for the first 50 plants.

(ii) If the selected plant is not one of the circled species, record the data as previously described. In addition, locate the nearest plant of any of the circled species and record its utilization (only) in the appropriate column opposite the species plant code. Do not record age class and form class for these additional plants.

(b) Age Class. Age class data reflect the establishment, survival, and decadence of key browse plants. Observe the selected plant and record (by dot tally) the age class by species in the appropriate column on the form. The four age classes are as follows:

- S - Seedling - New plants that have survived at least one growing season, but are not more than two or three years old. The basal stems are generally 1/8 inch or less in diameter.
- Y - Young - Young plants usually less than 10 years old. Elongated growth form and simple branching with basal stems no greater than approximately 1/2 inch in diameter.
- M - Mature - Plants more than 10 years old. Distinguished by heavier, often gnarled stems, and complex branching. Canopy made up of more than 50 percent living wood. Basal stems are often greater than 1/2 inch in diameter.
- D - Decadent - Browse plants with more than 50 percent of the canopy area dead.

(c) Form Class. Observe the selected plant and record (by dot tally) the form class by species in the appropriate column on the form.

## i. The form classes are as follows:

No.	Form Class
1	All available, little or no hedging
2	All available, moderately hedged
3	All available, severely hedged
4	Partially available, little or no hedging
5	Partially available, moderately hedged
6	Partially available, severely hedged
7	Unavailable
8	Dead

## RANGELAND MONITORING - UTILIZATION STUDIES

ii. Availability refers to browse available to the animals.

iii. The three degrees of hedging are based on the length and appearance of two-year-old wood (previous year's leaders) immediately below the current leaders. (See Illustration 19.) If more than one degree of hedging is evident on a plant, form class is based on the predominant or average condition. The three degrees of hedging are:

Little or no hedging	-	Two-year-old wood is relatively long and unaltered or only slightly altered.
Moderately hedged	-	Two-year-old wood is fairly long but most of it has been altered from the normal growth form.
Severely hedged	-	Two-year-old wood is relatively short and/or strongly altered from the normal growth form.

iv. Browse plants are considered to reflect the normal growth form when less than 50 percent of the two-year-old growth (the previous year's leaders) has clipped ends and a majority of the current leaders extend directly from terminal buds off two-year-old wood. Alterations from the normal growth form are reflected when 50 percent or more of the two-year-old wood has clipped ends. Current leaders occur mostly as extensions from lateral buds off two-year-old wood in the moderately hedged condition or as clumped lateral and/or adventitious sprouts in the severely hedged condition.

v. The length of two-year-old wood reflects the relative vigor of the previous year's leader growth and/or the effects of prior use. Since the degrees of hedging are confined to two-year-old wood, they reflect the effects of use during a previous year, or a succession of previous years.

vi. The three degrees of hedging provide a measure of the relative condition of browse plants and assess short-term effects of different intensities of leader use.

g. Calculations. Make the calculations and record the results in the appropriate columns on the Utilization Study Data - Extensive Browse Method Form. (See Illustration 20.)

(1) Average Utilization by Species.

## RANGELAND MONITORING - UTILIZATION STUDIES

(a) For each species, multiply the number of browse plants tallied in each percentage block by the percent indicated in the column heading (0, 10, 20, 30, etc.). Add the figures from each block and enter the total in the Total Percent Utilized Column on the form.

(b) Add the dot tallies for each browse species to determine the total number of plants sampled of that species and enter the total in the Number of Plants Column on the form.

(c) Calculate the average percent utilization for each species by dividing the total percent utilized by the total number of plants. Enter the value in the Average Percent Utilization Column on the form.

(2) Age Class Summary. Add the dot tallies for each age class and enter the totals in the Total Number of Plants Row on the form. Because the age class is determined for 100 plants on the transect, these totals represent the percent composition by age class for the browse portion of the plant community.

(3) Form Class Summary. Add the dot tallies for each form class and enter the totals in the Total Number of Plants Row on the form. Because the form class is determined for 100 plants on the transect, these totals represent the percent composition by form class for the browse portion of the plant community.

(4) Percent Composition by Species. Add the form class dot tallies for each browse species and enter the total in the Number of Plants Column on the form. Because the form class is determined for 100 plants on the transect, these totals represent the species composition percentages for the browse portion of the plant community.

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## RANGELAND MONITORING - UTILIZATION STUDIES

GLOSSARY OF TERMS

-A-

actual use: a report of the actual livestock grazing use certified to be accurate by the permittee or lessee. Actual use may be expressed in terms of animal unit months or animal months. (See 43 CFR 4100.0-5.)

allotment: an area of land designated and managed for grazing of livestock. Such an area may include intermingled private, State, or Federal lands used for grazing in conjunction with the public lands. (See 43 CFR 4100.0-5.)

allotment management plan (AMP): a documented program which applies to livestock grazing on the public lands, prepared in consultation, cooperation, and coordination with the permittee(s), lessee(s), or other involved affected interests. (See 43 CFR 4100.0-5.)

analysis: (1) a detailed examination of anything complex in order to understand its nature or determine its essential features; or (2) a separating or breaking up of any whole into its component parts for the purpose of examining their nature, function, relationship, etc. (A rangeland analysis includes an examination of both biotic (plants, animals, etc.) and abiotic (soils, topography, etc.) attributes of the rangeland.)

animal month: a month's tenure upon the rangeland by one animal. Animal month is not synonymous with animal unit month.

animal unit month (AUM): the amount of forage necessary for the sustenance of one cow or its equivalent for a period of one month. (See 43 CFR 4100.0-5.)

available forage: that portion of the forage production that is accessible for use by a specified kind or class of grazing animal.

-B-

browse: (1) the part of shrubs, half shrubs, woody vines, and trees available for animal consumption; or (2) to search for or consume browse.

browse plant or browse species: a shrub, half shrub, woody vine, or tree capable of producing shoot, twig, and leaf growth suitable for animal consumption.

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## RANGELAND MONITORING - UTILIZATION STUDIES

-C-

canopy cover: the percentage of ground covered by a vertical projection downward of the outermost perimeter of the natural spread of foliage of plants. Small openings within the canopy are included. Canopy cover is synonymous with crown cover.

class of livestock: the age and/or sex groups of a kind of livestock.

community: an assemblage of populations of plants and/or animals in a common spatial arrangement.

composition: the proportions (percentages) of various plant species in relation to the total on a given area. It may be expressed in terms of cover, density, weight, etc.

crown cover: (See canopy cover.)

-D-

density: numbers of individuals or stems per unit area. (Density does not equate to any kind of cover measurement.)

-E-

ecological site: (See range site.)

ecological status: the present state of vegetation of a range site in relation to the potential natural community for the site. Ecological status is use independent. It is an expression of the relative degree to which the kinds, proportions, and amounts of plants in a community resemble that of the potential natural community. The four ecological status classes correspond to 0-25, 26-50, 51-75, or 76-100 percent similarity to the potential natural community and are called early seral, mid seral, late seral, and potential natural community, respectively.

estimated use: the use made of forage on an area by wildlife, wild horses, wild burros, and/or livestock where actual use data are not available. Estimated use may be expressed in terms of animal unit months or animal months.

evaluation: (1) an examination and judgment concerning the worth, quality, significance, amount, degree, or condition of something; or (2) the systematic process for determining the effectiveness of on-the-ground management actions and assessing progress toward meeting management objectives.

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## RANGELAND MONITORING - UTILIZATION STUDIES

-F-

forage: (1) browse and herbage which is available and may provide food for animals or be harvested for feeding; or (2) to search for or consume forage.

forage production: the weight of forage that is produced within a designated period of time or a given area. Production may be expressed as green, air dry, or oven dry weight. The term may also be modified as to time of production such as annual, current year, or seasonal forage production.

forb: (1) any herbaceous plant other than those in the Gramineae (true grasses), Cyperaceae (sedges), and Juncaceae (rushes) families--i.e., any nongrass-like plant having little or no woody material on it; or (2) a broadleaved flowering plant whose stem, above ground, does not become woody and persistent.

forestland: land on which the vegetation is dominated by trees. Lands are classified forestland if the trees now present will provide 25 percent or greater canopy cover at maturity. Lands not presently forestland that were originally or could become forested through natural succession may be classified as potential natural forestland.

frequency: a quantitative expression of the presence or absence of individuals of a species in a population. It is defined as the percentage of occurrence of a species in a series of samples of uniform size.

-G-

goal: the desired state or condition that a resource management policy or program is designed to achieve. A goal is usually not quantifiable and may not have a specific date by which it is to be completed. Goals are the base from which objectives are developed. (See objective.)

grass: any plant of the family Gramineae.

grassland: land on which the vegetation is dominated by grasses, grasslike plants, and/or forbs. Non-forested lands are classified as grassland if herbaceous vegetation provides at least 80 percent of the canopy cover excluding trees. Lands not presently grassland that were originally or could become grassland through natural succession may be classified as potential natural grassland.

grasslike plant: a plant of the Cyperaceae or Juncaceae families which vegetatively resembles a true grass of the Gramineae family.

RANGELAND MONITORING - UTILIZATION STUDIES

grazing management: the manipulation of grazing and browsing animals to accomplish a desired result.

-H-

half shrub: a plant with a woody base whose annually produced stems die each year.

hedging: (1) the appearance of browse plants that have been browsed so as to appear artificially clipped; or (2) consistent browsing of terminal buds of browse species causing excessive lateral branching and a reduction in upward and outward growth.

herbage: the above-ground material of any herbaceous plant (grasses and forbs).

-I-

interpretation: explaining or telling the meaning of something and presenting it in understandable terms.

inventory: the systematic acquisition and analysis of information needed to describe, characterize, or quantify resources for land-use planning and management of the public lands.

-K-

key area: a relatively small portion of a rangeland selected because of its location, use, or grazing value as an area on which to monitor the effects of grazing use. It is assumed that key areas, if properly selected, will reflect the effects of current grazing management over all or a part of a pasture, allotment, or other grazing unit.

key species: (1) those species which must, because of their importance, be considered in a management program; or (2) forage species whose use serves as an indicator to the degree of use of associated species.

kind of livestock: species of domestic livestock--cattle, sheep, horses, burros, and goats.

-M-

monitoring: the orderly collection, analysis, and interpretation of resource data to evaluate progress toward meeting management objectives.

RANGELAND MONITORING - UTILIZATION STUDIES

-0-

objective: planned results to be achieved within a stated time period. Objectives are subordinate to goals, are narrower and shorter in range, and have increased possibility of attainment. Time periods for completion and outputs or achievements that are measurable and quantifiable are specified. (See goal.)

-P-

pasture: grazing area enclosed and separated from other areas by fence or natural barrier.

physiognomy: external aspect; characteristic or peculiar contour.

plant association: a kind of potential natural community consisting of stands with essentially the same dominant species in corresponding layers.

potential natural community (PNC): the biotic community that would become established if all successional sequences were completed without interferences by man under the present environmental conditions. Natural disturbances are inherent in development. Includes naturalized non-native species.

proper use: (1) a degree of utilization of current year's growth which, if continued, will achieve management objectives and maintain or improve the long-term productivity of the site; or (2) the percentage a plant is utilized when the rangeland as a whole is properly utilized. Proper use varies with time and systems of grazing. Proper use is synonymous with proper utilization.

proper utilization: (See proper use.)

public lands: any land and interest in land outside of Alaska owned by the United States and administered by the Secretary of the Interior through the Bureau of Land Management. (See 43 CFR 4100.0-5.)

-R-

rangeland: a kind of land which supports vegetation useful for grazing on which routine management of that vegetation is through manipulation of grazing rather than cultural practices. (Rangelands include natural grasslands, savannas, shrublands, moist deserts, tundra, alpine communities, coastal marshes, riparian zones, and wet meadows. Rangeland includes lands revegetated naturally or artificially to provide a plant cover which is managed like native vegetation.)

## RANGELAND MONITORING - UTILIZATION STUDIES

range site: a kind of rangeland with a specific potential natural community and specific physical site characteristics, differing from other kinds of rangeland in its ability to produce vegetation and to respond to management. Range sites are defined and described with soil, species composition, and production emphasis. Range site is synonymous with ecological site.

resource value rating (RVR): the value of vegetation present on a range site for a particular use or benefit. Resource value ratings may be established for each plant community capable of being produced on a range site, including exotic or cultivated species. On a given range site, each use (or potential use) has a separate resource value rating because that rating is based on classification of plants according to their value for a specific use. Some examples: A resource value rating for forage useful for cows and calves during the spring grazing season could be based on proper use factors (PUF's) or a more general assigning of plant species to good, moderate, or poor categories of forage value. Resource value ratings could then be based on production, cover, density, or frequency of plants in the different categories. A resource value rating for cover useful for a pronghorn fawning area might be based on density or cover of plants of a certain height or size class, without regard to plant species. A resource value rating related to scenic beauty might be based on abundance of flowering species, species with fall color, evergreens, diversity of growth forms, etc.

riparian zone: the banks and adjacent areas of water bodies, water courses, seeps, and springs whose waters provide soil moisture sufficiently in excess of that otherwise available locally so as to provide a more moist habitat than that of contiguous flood plains and uplands.

-S-

savanna: a grassland with scattered trees, whether as individuals or clumps; often a transitional type between true grassland and forest.

seral community: one of a series of biotic communities that follow one another in time on any given area. Seral community is synonymous with seral stage, successional community, and successional stage.

seral stage: (See seral community.)

shrub: a plant that has persistent, woody stems and a relatively low growth habit, and that generally produces several basal shoots instead of a single bole. It differs from a tree by its low stature--less than 5 meters (16 feet)--and nonarborescent form.

shrubland: land on which the vegetation is dominated by shrubs. Non-forested lands are classified as shrubland if shrubs provide more than 20 percent of the canopy cover excluding trees. Lands not presently shrubland that were originally or could become shrubland through natural succession may be classified as potential natural shrubland.

stratification: subdividing an area into units which are, more or less, internally homogeneous with respect to the (those) characteristic(s) of interest.

succession: the orderly process of community change; it is the sequence of communities which replace one another in a given area.

successional community: (See seral community.)

successional stage: (See seral community.)

-T-

tree: a woody perennial, usually single-stemmed plant that has a definite crown shape and characteristically reaches a mature height of at least 5 meters (16 feet). Some plants, such as oaks (Quercus spp.), may grow as either trees or shrubs.

trend: the direction of change in ecological status or in resource value ratings observed over time. Trend in ecological status is described as "toward" or "away from" the potential natural community or as "not apparent." Appropriate terms are used to describe trend in resource value ratings. Trend in resource value ratings for several uses on the same site at a given time may be in different directions and there is no necessary correlation between trends in resource value ratings and trend in ecological status.

-U-

unsuitable rangeland: rangeland which has no potential value for, or which should not be used for, a specific use because of permanent physical or biological restrictions. When unsuitable rangeland is identified, the identification must specify what use or uses are unsuitable (e.g., "unsuitable for cattle grazing").

use: (See utilization.)

useable forage: that portion of the forage that can be grazed without damage to the basic resources; may vary with season of use, species, and associated species.

## RANGELAND MONITORING - UTILIZATION STUDIES

utilization: the proportion or degree of current year's forage production that is consumed or destroyed by animals (including insects). May refer either to a single plant species, a group of species, or to the vegetation as a whole. Utilization is synonymous with use.

-V-

vegetation: plants in general, or the sum total of the plant life above and below ground in an area.

vegetation type: a kind of existing plant community with distinguishable characteristics described in terms of the present vegetation that dominates the aspect or physiognomy of the area.

-W-

wet meadow: a meadow where the surface remains wet or moist throughout the summer, usually characterized by sedges and rushes.

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Investigation 1  
Page 1

STUDY LOCATION & DOCUMENTATION DATA

STUDY METHOD				STUDY NUMBER			
ALLOTMENT NAME & NUMBER				PASTURE			
DISTRICT		RESOURCE AREA		PLANNING UNIT			
RANGE SITE				PLANT COMMUNITY			
DATE ESTABLISHED		ESTABLISHED BY (NAME)		MAP REFERENCE			
ELEVATION		SLOPE		EXPOSURE		AERIAL PHOTO REFERENCE	
TOWNSHIP		RANGE		SECTION		1/4 1/4 1/4	
LOCATION						SCALE: _____ INCHES EQUALS ONE MILE	
KEY SPECIES							
1	2	3					
DISTANCE & BEARING BETWEEN REFERENCE POST OR REFERENCE POINT AND THE TRANSECT LOCATION STAKE, BEGINNING OF TRANSECT, OR PLOT							
DISTANCE & BEARING BETWEEN LOCATION STAKE & BEARING STAKE							
TRANSECT BEARING				VERTICAL DISTANCE BETWEEN GROUND & ALIGNED TAPE			
LENGTH OF TRANSECT				PLOT/FRAPE SIZE			
SAMPLING INTERVAL				TOTAL NUMBER OF SAMPLES			

NOTES (DESCRIPTION OF STUDY LOCATION, DIAGRAM OF TRANSECT/PLOT LAYOUT, DESCRIPTION OF PHOTO  
POINTS, ETC. IF MORE SPACE IS NEEDED, USE REVERSE SIDE OR ANOTHER PAGE.)

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STUDY LOCATION & DOCUMENTATION DATA

STUDY METHOD

STUDY NUMBER

OCULAR ESTIMATE UTILIZATION | 035-27W-08-04

ALLOTMENT NAME & NUMBER

PASTURE

QUAKING ASPEN - 1037 | SHEEP CREEK

DISTRICT

RESOURCE AREA

PLANNING UNIT

HOWE | LOST MOUNTAIN | DEEP CANYON

RANGE SITE

PLANT COMMUNITY

CLAYEY - 15-19" NORTHERN PLAINS | ARTR2-AGSP-PONE

DATE ESTABLISHED

ESTABLISHED BY (NAME)

MAP REFERENCE

7/15/84 | CHARLIE WAGON | GRAYSTONE 7 1/2 MIN. TOPO.

ELEVATION

SLOPE

EXPOSURE

AERIAL PHOTO REFERENCE

4200 | | EAST | BLM-24CN-A277A-4/22/78

TOWNSHIP

RANGE

SECTION

1/4

1/4

1/4

SCALE: 2 INCHES  
EQUALS ONE MILE

LOCATION

2S

27W

8

NE

SW

NW

KEY SPECIES

1 AGSP

2

3

X

DISTANCE & BEARING BETWEEN REFERENCE POST OR REFERENCE POINT

AND THE TRANSECT LOCATION STAKE, BEGINNING OF TRANSECT, OR PLOT

The beginning of the transect is 100 feet north of  
the reference post - there is no permanent location stake.

DISTANCE & BEARING BETWEEN LOCATION STAKE & BEARING STAKE

TRANSECT BEARING

VERTICAL DISTANCE BETWEEN GROUND & ALIGNED TAPE

25° - toward highest point on skyline

LENGTH OF TRANSECT

PLOT/FRAME SIZE

No frame

SAMPLING INTERVAL

TOTAL NUMBER OF SAMPLES

Every 2 paces

50

NOTES (DESCRIPTION OF STUDY LOCATION, DIAGRAM OF TRANSECT/PLOT LAYOUT, DESCRIPTION OF PHOTO  
POINTS, ETC. IF MORE SPACE IS NEEDED, USE REVERSE SIDE OR ANOTHER PAGE.)

This study is located approximately 1 mile north of the  
Antelope Draw spring development.

Note: Depending on the study method, fill in the blocks that apply when  
a study is established. This documentation enables the examiners to conduct  
follow-up studies in a consistent manner to provide comparable data  
for analysis, interpretation, and evaluation.

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Illustration 2  
Page 1

UTILIZATION STUDY DATA  
PAIRED PLOT METHOD

STUDY NUMBER \_\_\_\_\_ DATE \_\_\_\_\_ EXAMINER \_\_\_\_\_  
ALLOTMENT NAME & NUMBER \_\_\_\_\_ PASTURE \_\_\_\_\_  
KIND AND/OR CLASS OF ANIMAL \_\_\_\_\_ PERIOD OF USE \_\_\_\_\_

KEY SPECIES	PLOT	WEIGHT IN GRAMS BY PLOT					TOTAL WEIGHT ***	WEIGHT DIFFERENCE (P-U)	PERCENT UTILIZED $\left(\frac{P-U}{P} \times 100\right)$
		1	2	3	4	5			
11	P*								
	U**								
12	P								
	U								
13	P								
	U								
14	P								
	U								

LOCATION OF PAIRED PLOT 1

LOCATION OF PAIRED PLOT 2

LOCATION OF PAIRED PLOT 3

LOCATION OF PAIRED PLOT 4

LOCATION OF PAIRED PLOT 5

NOTES (USE OTHER SIDE OR ANOTHER PAGE, IF NECESSARY)

\*PROTECTED PLOTS

\*\*UNPROTECTED PLOTS

\*\*\*MINUS WEIGHT OF THE SACK

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UTILIZATION STUDY DATA  
PAIRED PLOT METHOD

STUDY NUMBER 155-38E-12-02		DATE 8/15/84		EXAMINER SAM CRABTREE					
ALLOTMENT NAME & NUMBER LAVA CREEK - 2287		IPASTURE							
KIND AND/OR CLASS OF ANIMAL SHEEP - EWES & LAMBS		PERIOD OF USE 6/1 to 8/15							
KEY SPECIES	PLOT	WEIGHT IN GRAMS BY PLOT					TOTAL WEIGHT ***	WEIGHT DIFFERENCE (P-U)	PERCENT UTILIZED $\left(\frac{P-U}{P} \times 100\right)$
		1	2	3	4	5			
1 AGSP	P*	25	40	28	20	28	161	76	47%
	U**	15	25	15	18	12	85		
2 PONE2	P	20	28	19	43	25	145	80	55%
	U	16	12	8	17	11	65		
3	P								
	U								
4	P								
	U								

LOCATION OF PAIRED PLOT 1 Caged plot is .5 mile south of road junction in Section 22 - then 200 feet west of road. Uncaged plot is 700 feet SW of caged plot - compass bearing 220° - marked with reinforcing rod.

LOCATION OF PAIRED PLOT 2 Caged plot is 1500 feet north of caged plot 1 - compass bearing 350°. Uncaged plot is 150 feet west of caged plot - compass bearing 265° - marked with reinforcing rod.

LOCATION OF PAIRED PLOT 3 Caged plot is .7 mile west of Springcreek Reservoir. Uncaged plot is 75 paces north of caged plot - marked with reinforcing rod.

LOCATION OF PAIRED PLOT 4 Caged plot is 500 paces south of caged plot 2. Uncaged plot is 50 paces east of caged plot - marked with reinforcing rod.

LOCATION OF PAIRED PLOT 5 Caged plot is .3 mile north of Buckbrush Cattleguard - then 700 feet east of road. Uncaged plot is 200 feet north of caged plot - compass bearing 15° - marked with reinforcing rod.

NOTES (USE OTHER SIDE OR ANOTHER PAGE, IF NECESSARY)

\*PROTECTED PLOTS

\*\*UNPROTECTED PLOTS

\*\*\*MINUS WEIGHT OF THE SACK

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UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENTIllustration 3  
Page 1UTILIZATION STUDY DATA  
OCULAR ESTIMATE METHOD

STUDY NUMBER		DATE		EXAMINER												
ALLOTMENT NAME & NUMBER		PASTURE		PERIOD OF USE												
KIND AND/OR CLASS OF ANIMAL		PERIOD OF USE														
OCULAR ESTIMATES BY PLANT (OR PLOT)																
KEY SPECIES	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	TOTAL
TOTAL + NO. OF SAMPLES (PLANTS OR PLOTS) = AVG. PERCENT UTILIZATION																
÷ =																

NOTES (USE OTHER SIDE OR ANOTHER PAGE, IF NECESSARY)

OCULAR ESTIMATES BY PLANT (OR PLOT)																
KEY SPECIES	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	TOTAL
TOTAL + NO. OF SAMPLES (PLANTS OR PLOTS) = AVG. PERCENT UTILIZATION																
÷ =																

NOTES (USE OTHER SIDE OR ANOTHER PAGE, IF NECESSARY)

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UTILIZATION STUDY DATA  
KEY FORAGE PLANT METHOD

STUDY NUMBER		IDATE		IEXAMINER	
ALLOTMENT NAME & NUMBER				IPASTURE	
KIND AND/OR CLASS OF ANIMAL				IPERIOD OF USE	
IKEY SPECIES		IKEY SPECIES			
INT	INO BY	NO X	INT	INO BY	NO X
CLASS	IMID	DOT	CLASS	IMID	DOT
INTERVAL (M)	COUNT	(C)	INTERVAL (M)	COUNT	(C)
NO USE					
0-5%	12.5				
SLIGHT					
6-20%	13				
LIGHT					
21-40%	30				
MODERATE					
41-60%	50				
HEAVY					
61-80%	70				
SEVERE					
81-100%	90				
ITOTALS			ITOTALS		
I AVG. = $\frac{\sum CM}{\sum C}$					
I UTIL. = $\frac{\sum CM}{\sum C}$					

Herbaceous Utilization Classes. (Brown utilization classes are on the other side.)

1. No use (0-5%). The rangeland shows no evidence of grazing use; or the rangeland has the appearance of negligible grazing.

2. Slight (6-20%). The rangeland has the appearance of very light grazing. The key herbaceous forage plants may be topped or slightly used. Current seedstalks and young plants of key herbaceous species are little disturbed.

3. Light (21-40%). The rangeland may be topped, skinned, or grazed in patches. The low value herbaceous plants are ungrazed and 60 to 80 percent of the number of current seedstalks of key herbaceous plants remain intact. Most young plants are undamaged.

4. Moderate (41-60%). The rangeland appears entirely covered as uniformly as natural features and facilities will allow. Fifteen to 25 percent of the number of current seedstalks of key herbaceous species remain intact. No more than 10 percent of the number of low value herbaceous forage plants are utilized. (Moderate use does not imply proper use.)

5. Heavy (61-80%). The rangeland has the appearance of complete search. Key herbaceous species are almost completely utilized with less than 10 percent of the current seedstalks remaining. Shoots of rhizomatous grasses are missing. More than 10 percent of the number of low value herbaceous forage plants have been utilized.

6. Severe (81-100%). The rangeland has a worn appearance and there are indications of repeated coverage. There is no evidence of reproduction or current seedstalks of key herbaceous species. Key herbaceous forage species are completely utilized. The remaining stubble of preferred grasses is grazed to the soil surface.

NOTES (USE OTHER SIDE OR ANOTHER PAGE, IF NECESSARY)

\*WHERE C = THE NUMBER OF OBSERVATIONS WITHIN EACH CLASS INTERVAL (C COLUMN),  
M = THE CLASS INTERVAL MIDPOINT (M COLUMN), AND  $\Sigma$  = THE SUMMATION SYMBOL.

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Browse Utilization Classes

1. No use (0-5%). Browse plants show no evidence of use; or browse plants have the appearance of negligible use.
2. Slight (6-20%). Browse plants have the appearance of very light use. The available leaders of key browse plants are little disturbed.
3. Light (21-40%). There is obvious evidence of leader use. The available leaders appear cropped or browsed in patches and 60 to 80% of the available leader growth of the key browse plants remains intact.
4. Moderate (41-60%). Browse plants appear rather uniformly utilized and 40 to 60% of the available leader growth of key browse plants remains intact.
5. Heavy (61-80%). The use of the browse gives the appearance of complete search. The preferred browse plants are hedged and some plant clumps may be slightly broken. Nearly all available leaders are used and few terminal buds remain on key browse plants. Between 20 to 40% of the available leader growth of the key browse plants remains intact.
6. Severe (81-100%). There are indications of repeated coverage. There is no evidence of terminal buds and usually less than 20% of available leader growth on the key browse plants remains intact. Some, and often much, of the second and third years' growth of the browse plants has been utilized. Hedging is readily apparent and the browse plants are more frequently broken.

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UTILIZATION STUDY DATA  
KEY FORAGE PLANT METHOD

STUDY NUMBER MOONCREEK #1 DATE 6/30/84 EXAMINER BUCK CHUGWATER

ALLOTMENT NAME & NUMBER MOONCREEK - 0817 IPASTURE

KIND AND/OR CLASS OF ANIMAL CATTLE - Cows & CALVES PERIOD OF USE 5/1 to 7/30

KEY SPECIES				KEY SPECIES			
BOCU							
INT	BY	NO	X	INT	BY	NO	X
CLASS	MID	DOT	CLASS	MIDPT	DOT	CLASS	MIDPT
INTERVAL (M)	COUNT	(C)	(C)(M)	COUNT	(C)	(C)(M)	

NO USE							
0-5%	12.5	1	6	15			

SLIGHT							
6-20%	13	2	4	52			

LIGHT							
21-40%	30	1	16	480			

MODERATE							
41-60%	50	1	12	600			

HEAVY							
61-80%	70	1	2	140			

SEVERE							
81-100%	90	1					

TOTALS 40 1287 TOTALS

AVG. =  $\frac{\Sigma CM}{\Sigma C}$  =  $\frac{1287}{40} = 32\%$

Herbaceous Utilization Classes. (Browse utilization classes are on the other side.)

1. No use (0-5%). The rangeland shows no evidence of grazing use; or the rangeland has the appearance of negligible grazing.
2. Slight (6-20%). The rangeland has the appearance of very light grazing. The key herbaceous forage plants may be topped or slightly used. Current seedstalks and young plants of key herbaceous species are little disturbed.
3. Light (21-40%). The rangeland may be topped, skinned, or grazed in patches. The low value herbaceous plants are ungrazed and 60 to 80 percent of the number of current seedstalks of key herbaceous plants remain intact. Most young plants are undamaged.
4. Moderate (41-60%). The rangeland appears entirely covered as uniformly as natural features and facilities will allow. Fifteen to 25 percent of the number of current seedstalks of key herbaceous species remain intact. No more than 10 percent of the number of low value herbaceous forage plants are utilized. (Moderate use does not imply proper use.)
5. Heavy (61-80%). The rangeland has the appearance of complete search. Key herbaceous species are almost completely utilized with less than 10 percent of the current seedstalks remaining. Shoots of rhizomatous grasses are missing. More than 10 percent of the number of low value herbaceous forage plants have been utilized.
6. Severe (81-100%). The rangeland has a mown appearance and there are indications of repeated coverage. There is no evidence of reproduction or current seedstalks of key herbaceous species. Key herbaceous forage species are completely utilized. The remaining stubble of preferred grasses is grazed to the soil surface.

NOTES (USE OTHER SIDE OR ANOTHER PAGE, IF NECESSARY)

The ranch foreman, Bud Gloss, participated in the collection of the utilization data. He felt that the average % utilization obtained by the study accurately reflected the amount of use.

\*WHERE C = THE NUMBER OF OBSERVATIONS WITHIN EACH CLASS INTERVAL (C COLUMN),  
M = THE CLASS INTERVAL MIDPOINT (M COLUMN), AND Σ = THE SUMMATION SYMBOL.

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Illustration 5

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 UTILIZATION STUDY DATA  
 HEIGHT-WEIGHT METHOD

STUDY NUMBER		DATE		EXAMINER	
PLOT NAME & NUMBER				PASTURE	
KIND AND/OR CLASS OF ANIMAL				PERIOD OF USE	
KEY SPECIES				CULM/ICULMLESS/	
HEIGHT	%	HEIGHT	%	HEIGHT	%
1		161		131	
2		171		132	
3		181		133	
4		191		134	
5		201		135	
6		211		136	
7		221		137	
8		231		138	
9		241		139	
10		251		140	
11		261		141	
12		271		142	
13		281		143	
14		291		144	
15		301		145	
NUMBER OF UNGRAZED PLANTS		TOTAL HEIGHT OF UNGRAZED PLANTS		TOTAL % UTIL FOR ALL SAMPLED PLANTS	
TOTAL HEIGHT OF UNGRAZED PLANTS		AVERAGE UNGRAZED PLANT HEIGHT		TOTAL PERCENT UTILIZATION	
NUMBER OF UNGRAZED PLANTS		=		= AVERAGE UTILIZATION	

NOTES (USE OTHER SIDE OR ANOTHER PAGE, IF NECESSARY)

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Illustration 5  
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UTILIZATION STUDY DATA  
HEIGHT-WEIGHT METHOD

STUDY NUMBER <b>(0-3-21) 8 Bac - 1</b>				DATE <b>7/31/84</b>				EXAMINER <b>JACK BORDER</b>			
ALLOTMENT NAME & NUMBER <b>MEDICINE CREEK - 1083</b>				IPASTURE <b>SPRING WATER</b>							
KIND AND/OR CLASS OF ANIMAL <b>CATTLE - Cows &amp; CALVES</b>				PERIOD OF USE <b>7/1 to 9/30</b>							
KEY SPECIES <b>STC04</b>								CULM <input checked="" type="checkbox"/> CULMLESS <input type="checkbox"/>			

	HEIGHT	%	HEIGHT	%	HEIGHT	%	HEIGHT	%	HEIGHT	%	
1	6	10	16	13	0	31	3	30	16	2	43
2	4	21	17	4	21	32	10	0	17	16	0
3	14	0	18	9	0	33	5	14	18	15	0
4	8	5	19	5	14	34	14	0	19	3	30
5	10	0	20	3	30	35	14	0	20	2	43
6	7	7	21	4	21	36	3	30	21	12	0
7	2	43	22	3	30	37	2	43	22	4	21
8	8	5	23	16	0	38	4	21	23	14	0
9	11	0	24	2	43	39	1	71	24	5	14
10	4	21	25	7	7	40	6	10	25	1	71
11	6	10	26	13	0	41	3	30	26	3	30
12	13	0	27	14	0	42	2	43	27	10	0
13	15	0	28	5	14	43	13	0	28	2	43
14	8	5	29	4	21	44	4	21	29	14	0
15	2	43	30	12	0	45	3	30	30	3	30

NUMBER OF UNGRAZED PLANTS	21	TOTAL HEIGHT OF UNGRAZED PLANTS	272	NUMBER OF SAMPLED PLANTS	60	TOTAL % UTIL FOR ALL SAMPLED PLANTS	1029
TOTAL HEIGHT OF UNGRAZED PLANTS		AVERAGE UNGRAZED PLANT HEIGHT		TOTAL PERCENT UTILIZATION NUMBER OF SAMPLED PLANTS		AVERAGE UTILIZATION	
		272 = 13 21 inches				1029 60 = 17%	

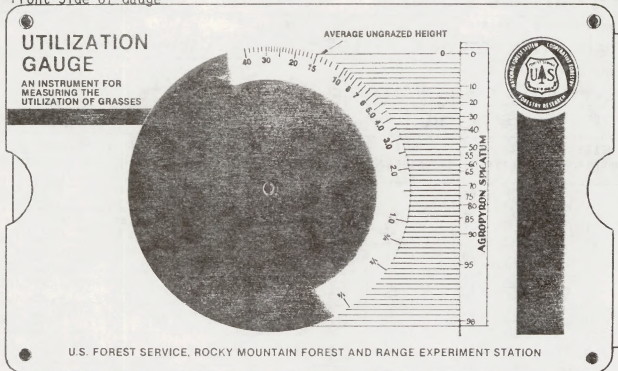
NOTES (USE OTHER SIDE OR ANOTHER PAGE, IF NECESSARY)

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RANGELAND MONITORING - UTILIZATION STUDIES

UTILIZATION GAUGE

Front Side of Gauge



Back Side of Gauge

INSTRUCTIONS FOR USE

A. Measure and record by species the heights of ungrazed plants: total, and divide by the number to determine average ungrazed height. If sufficient ungrazed plants do not occur on sampling area, measure plants adjacent to it.

For seedstalk producing (culm) plants, measure tallest seedstalk to nearest 1"; non-seedstalk producing (culmless) plants, the tallest leaf heights to 1/2".

B. Measure and record by species the heights of grazed plants. If plants are not cropped off evenly, measure average stubble height of each plant.

Measure all grazed plants to nearest 1/4".

C. Pull slide out of envelope until scale for species concerned appears in window.

D. Turn dial until average ungrazed height determined in "A" appears opposite Arrow so designated.

E. On dial find grazed heights recorded in "B" and opposite on slide read percent utilization for each plant.

F. Repeat operation for each grazed height, total utilization percentages and divide by the total number of plants. This gives average percentage utilization.

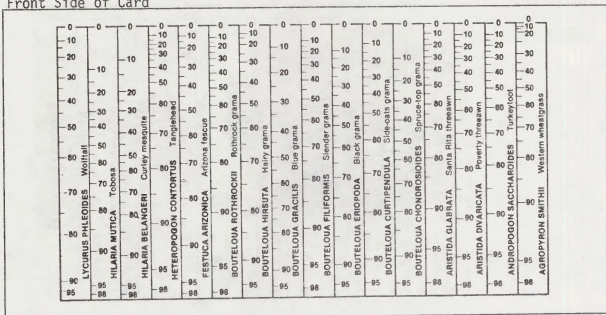
© 1960 AMERICAN Slide Chart Corp., Wheaton, Ill. 60187. Printed in U.S.A.

RANGELAND MONITORING - UTILIZATION STUDIES

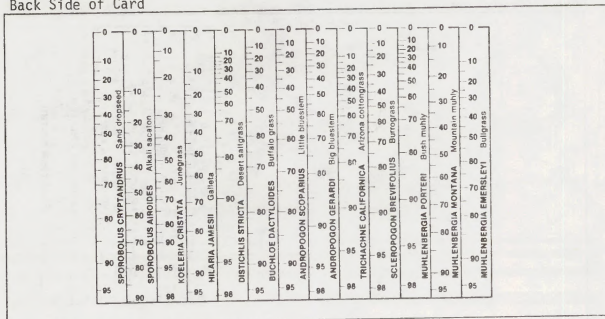
UTILIZATION GAUGE (continued)

These utilization scales must be checked to see whether or not they fit the species on the rangeland where they will be used.

Front Side of Card



Back Side of Card

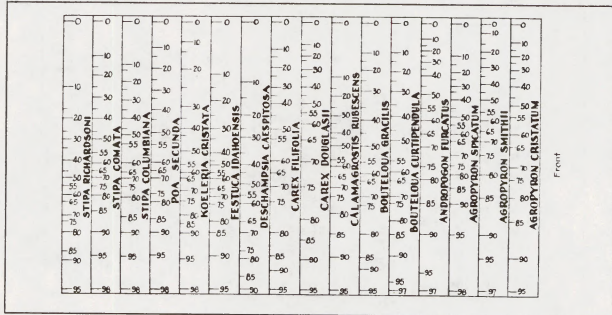


## RANGELAND MONITORING - UTILIZATION STUDIES

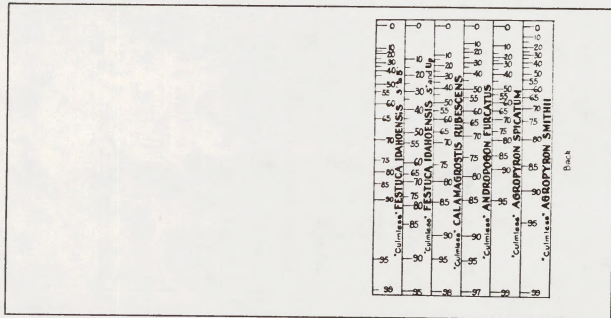
## UTILIZATION GAUGE (continued)

These utilization scales must be checked to see whether or not they fit the species on the rangeland where they will be used.

Front Side of Card



Back Side of Card



## RANGELAND MONITORING - UTILIZATION STUDIES

EXAMPLE DATA SET FOR DETERMINING HEIGHT-WEIGHT RELATIONSHIPS FOR PREPARINGUTILIZATION SCALES

<u>Height Segment (percent)</u>	<u>Dry Weight by Height Segment (grams)</u>	<u>Cumulative Dry Weight (grams)</u>	<u>Cumulative % Height Removed</u>	<u>Cumulative % Weight Removed</u>
0-10	2.8	2.8	10	0.9
11-20	5.6	8.4	20	2.6
21-30	7.0	15.4	30	4.8
31-40	8.4	23.8	40	7.4
41-50	15.4	39.2	50	12.2
51-60	22.1	61.3	60	19.0
61-70	38.3	99.6	70	30.9
71-80	54.6	154.2	80	47.8
81-90	75.7	229.9	90	71.3
91-100	92.6	322.5	100	100.0
	<hr/> 322.5			

## RANGELAND MONITORING - UTILIZATION STUDIES

EXAMPLE HEIGHT-WEIGHT CURVE USED FOR PREPARING UTILIZATION SCALES

Scientific Name and Code -

Common Name -

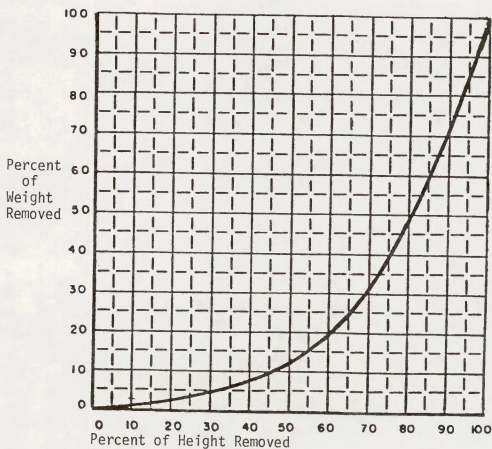
Culm Producing or Culmless Plants -

Allotment Name and Number -

Resource Area -

District -

Date -



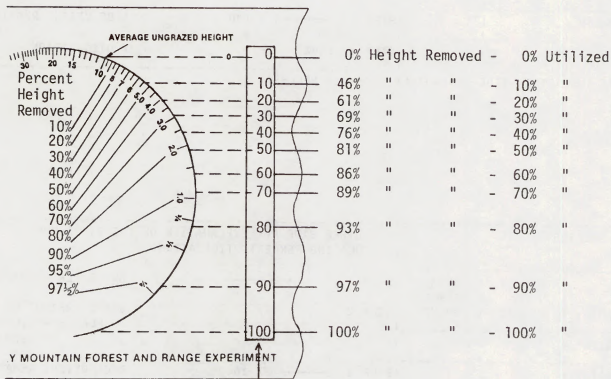
# RANGELAND MONITORING - UTILIZATION STUDIES

## METHOD FOR TRANSFERRING DATA FROM HEIGHT-WEIGHT CURVES TO UTILIZATION SCALES

Scientific Name and Code -

Common Name -

Date -



Utilization Scale

The percent height removed when 10%, 20%, etc., of the weight is removed is determined from the height-weight curve. (See Illustration 8.)

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UTILIZATION STUDY DATA  
ACTUAL WEIGHT METHOD

STUDY NUMBER			DATE		EXAMINER	
ALLOTMENT NAME & NUMBER			PASTURE			
KIND AND/OR CLASS OF ANIMAL			PERIOD OF USE			
KEY SPECIES			SEE OTHER SIDE FOR EXPLANATION OF THE STEPS FOR CALCULATING PERCENT UTILIZATION.			
	NUMBER OF PLANTS	TOTAL WEIGHT* (GRAMS)	STEP 1	_____	=	GRAMS PER UNGRAZED PLANT
PLANTS			STEP 2	X	=	GRAMS (WEIGHT OF ALL PLANTS AS IF NONE HAD BEEN GRAZED)
GRAZED						
UNGRAZED			STEP 3	_____ X 100	=	% OF WEIGHT REMAINING
TOTALS			STEP 4	100% -	=	% UTILIZATION

NOTES (USE OTHER SIDE OR ANOTHER PAGE, IF NECESSARY)

KEY SPECIES			SEE OTHER SIDE FOR EXPLANATION OF THE STEPS FOR CALCULATING PERCENT UTILIZATION.			
	NUMBER OF PLANTS	TOTAL WEIGHT* (GRAMS)	STEP 1	_____	=	GRAMS PER UNGRAZED PLANT
PLANTS			STEP 2	X	=	GRAMS (WEIGHT OF ALL PLANTS AS IF NONE HAD BEEN GRAZED)
GRAZED						
UNGRAZED			STEP 3	_____ X 100	=	% OF WEIGHT REMAINING
TOTALS			STEP 4	100% -	=	% UTILIZATION

NOTES (USE OTHER SIDE OR ANOTHER PAGE, IF NECESSARY)

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CALCULATE PERCENT UTILIZATION AS FOLLOWS:

STEP 1. CALCULATE THE AVERAGE WEIGHT OF UNGRAZED PLANTS.

$$\frac{\text{Total weight of ungrazed plants}}{\text{Total number of ungrazed plants}} = \text{Average weight of ungrazed plants}$$

STEP 2. CALCULATE THE TOTAL WEIGHT OF ALL CLIPPED PLANTS AS IF NONE HAD BEEN GRAZED.

$$\frac{\text{Total number of plants clipped (both grazed and ungrazed)}}{\text{Total number of plants clipped (both grazed and ungrazed)}} \times \frac{\text{Average weight of ungrazed plants}}{\text{Average weight of ungrazed plants}} = \frac{\text{Total weight of all clipped plants as if none had been grazed}}{\text{Total weight of all clipped plants as if none had been grazed}}$$

STEP 3. CALCULATE THE PERCENT OF TOTAL PRODUCTION (WEIGHT) REMAINING.

$$\frac{\text{Total weight of clipped plants (grazed and ungrazed)}}{\text{Total weight of all clipped plants as if none had been grazed}} \times 100 = \frac{\text{Percent of total production (weight) remaining}}{\text{Percent of total production (weight) remaining}}$$

STEP 4. CALCULATE THE PERCENT UTILIZED.

$$100\% - \text{Percent of total production (weight) remaining} = \text{Percent utilized}$$

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UTILIZATION STUDY DATA  
ACTUAL WEIGHT METHOD

STUDY NUMBER <b>RED BUTTE # 2</b>		DATE <b>9/15/84</b>		EXAMINER <b>JORGE GRANT</b>	
ALLOTMENT NAME & NUMBER <b>RED BUTTE - 0673</b>		PASTURE <b>LITTLE RED</b>			
KIND AND/OR CLASS OF ANIMAL <b>CATTLE - Cows &amp; CALVES</b>		PERIOD OF USE <b>6/16 to 9/15</b>			
KEY SPECIES <b>FEID</b>		SEE OTHER SIDE FOR EXPLANATION OF THE STEPS FOR CALCULATING PERCENT UTILIZATION.			
	NUMBER OF PLANTS	TOTAL WEIGHT* (GRAMS)	STEP 1	$\frac{142}{17} = 8.4$	GRAMS PER UNGRAZED PLANT
GRAZED	43	154	STEP 2	$60 \times 8.4 = 504$	GRAMS (WEIGHT OF ALL PLANTS AS IF NONE HAD BEEN GRAZED)
UNGRAZED	17	142	STEP 3	$\frac{296}{504} \times 100 = 59$	% OF WEIGHT REMAINING
TOTALS	60	296	STEP 4	$100\% - 59 = \underline{\underline{41}}$	% UTILIZATION

NOTES (USE OTHER SIDE OR ANOTHER PAGE, IF NECESSARY)

The permittee, Sam Johns, did an excellent job of spreading the salt in this pasture. It helped pull the cattle into areas that were not used last year.

KEY SPECIES		SEE OTHER SIDE FOR EXPLANATION OF THE STEPS FOR CALCULATING PERCENT UTILIZATION.			
	NUMBER OF PLANTS	TOTAL WEIGHT* (GRAMS)	STEP 1	_____ =	GRAMS PER UNGRAZED PLANT
GRAZED			STEP 2	X =	GRAMS (WEIGHT OF ALL PLANTS AS IF NONE HAD BEEN GRAZED)
UNGRAZED			STEP 3	_____ X 100 =	% OF WEIGHT REMAINING
TOTALS			STEP 4	100% - =	% UTILIZATION

NOTES (USE OTHER SIDE OR ANOTHER PAGE, IF NECESSARY)

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Illustration 11  
Page 1

UTILIZATION STUDY DATA  
STEM COUNT METHOD

STUDY NUMBER		DATE		EXAMINER												
ALLOTMENT NAME & NUMBER		PASTURE														
KIND AND/OR CLASS OF ANIMAL		PERIOD OF USE														
KEY SPECIES		STEM COUNT BY PLOT														
PLOT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	TOTALS
GRAZED																
UNGRAZED																
PLOT	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	TOTALS
GRAZED																
UNGRAZED																
PLOT	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	TOTALS
GRAZED																
UNGRAZED																
NOTES (USE OTHER SIDE OR ANOTHER PAGE, IF NECESSARY)		TOTAL GR STEMS		TOTAL GR + UNGR STEMS												
		$\frac{\text{GRAZED STEMS}}{\text{TOTAL STEMS}} \times 100 = \% \text{ UTILIZATION}$		$\frac{\text{STEMS GRAZED}}{\text{STEMS GRAZED}} \times 100 =$												

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Illustration 11  
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UTILIZATION STUDY DATA  
STEM COUNT METHOD

STUDY NUMBER 13N-41E-27-04															DATE 9/30/84															EXAMINER BOB JACKSTRAW														
ALLOTMENT NAME & NUMBER BLUE RIDGE - 0079															PASTURE CHOKECHERRY																													
KIND AND/OR CLASS OF ANIMAL HORSES															PERIOD OF USE 5/1 to 9/30																													
KEY SPECIES AGSM															STEM COUNT BY PLOT																													
PLOT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	TOTALS																												
GRAZED	5	6	4	7	8	5	6	2	5	3	3	4	9	9	6	82																												
UNGRAZED	3	8	9	0	6	10	8	9	5	6	8	1	5	3	2	83																												
PLOT	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	TOTALS																												
GRAZED	5	8	7	9	6	8	5	9	9	7	7	4	5	7	4	100																												
UNGRAZED	9	3	2	5	2	3	3	0	0	6	2	0	1	2	1	39																												
PLOT	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	TOTALS																												
GRAZED	5	2	3	7	7	5	7	4	6	10	4	5	3	6	2	76																												
UNGRAZED	5	9	8	0	2	9	2	9	1	1	1	10	6	2	9	74																												
NOTES (USE OTHER SIDE OR ANOTHER PAGE, IF NECESSARY)															TOTAL GR STEMS 258															TOTAL GR + UNGR STEMS 454														

The horses have  
trampled the area

around the undeveloped chokecherry spring until it is nothing but a mud hole. The spring head should be fenced and the water piped to a trough.

$$\frac{\text{GRAZED STEMS}}{\text{TOTAL STEMS}} \times 100 = \% \text{ UTILIZATION}$$

$$\frac{258}{454} \times 100 = 57\%$$

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Page 1

UTILIZATION STUDY DATA  
GRAZED-CLASS METHOD

STUDY NUMBER				DATE				EXAMINER			
ALLOTMENT NAME & NUMBER				PASTURE							
KIND AND/OR CLASS OF ANIMAL				PERIOD OF USE							
KEY SPECIES				KEY SPECIES				KEY SPECIES			
GRAZED CLASS PERCENTS (P)	DOT COUNT	NO BY CLASS (C)	NO X CLASS % (C)(P)	DOT COUNT	NO BY CLASS (C)	NO X CLASS % (C)(P)	DOT COUNT	NO BY CLASS (C)	NO X CLASS % (C)(P)		
0											
10											
30											
50											
70											
90											
TOTALS				TOTALS			TOTALS				
AVG. UTIL. = $\frac{\sum(CP)}{\sum C}$		=		=		=		=			

NOTES (USE OTHER SIDE OR ANOTHER PAGE, IF NECESSARY)

\*WHERE C = THE NUMBER OF PLANTS WITHIN EACH CLASS (C COLUMN),  
P = THE GRAZED-CLASS PERCENTAGES (P COLUMN), AND  $\Sigma$  = THE SUMMATION SYMBOL,

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Illustration 12  
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UTILIZATION STUDY DATA  
GRAZED-CLASS METHOD

STUDY NUMBER				DATE				EXAMINER			
SANDY ARROYO #2				10/30/84				ABNER SOUTHWATE			
ALLOTMENT NAME & NUMBER				PASTURE							
SANDY ARROYO - 0719				CREOSOTE KNOB							
KIND AND/OR CLASS OF ANIMAL				PERIOD OF USE							
CATTLE - YEARLINGS				8/1 to 12/31							
KEY SPECIES			KEY SPECIES			KEY SPECIES					
BOGR2											
GRAZED CLASS PERCENTS (P)	DOT COUNT	NO BY CLASS (C)	NO X CLASS % (C) (P)	DOT COUNT	NO BY CLASS (C)	NO X CLASS % (C) (P)	DOT COUNT	NO BY CLASS (C)	NO X CLASS % (C) (P)		
0	☒	12	0								
10	☒	17	170								
30	☒☒☒	32	960								
50	☒	16	800								
70	☒	3	210								
90											
TOTALS		80	2140	TOTALS			TOTALS				
$\text{AVG. UTIL.} = \frac{\sum CP\%}{\sum C} = \frac{2140}{80} = 27\%$											

NOTES (USE OTHER SIDE OR ANOTHER PAGE, IF NECESSARY)







The yearlings are scattered throughout the pasture - good distribution. Roadrunner Spring is just about dry; when it dries up, there will be no water in the northwest corner of the pasture.







\*WHERE C = THE NUMBER OF PLANTS WITHIN EACH CLASS (C COLUMN);  
P = THE GRAZED-CLASS PERCENTAGES (P COLUMN), AND Σ = THE SUMMATION SYMBOL.

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## RANGELAND MONITORING - UTILIZATION STUDIES

EXAMPLES OF GRAZED-CLASS METHOD PHOTO GUIDES

BLUE GRAMA —— PER CENT UTIL- IZATION	0	
	10	
	30	
	50	
	70	
	90	

SIDE- OATS GRAMA —— PER CENT UTIL- IZATION	0	
	10	
	30	
	50	
	70	
	90	

## RANGELAND MONITORING - UTILIZATION STUDIES

EXAMPLE DATA SET FOR DETERMINING HEIGHT-WEIGHT RELATIONSHIPS FOR  
DEVELOPING PHOTO GUIDES

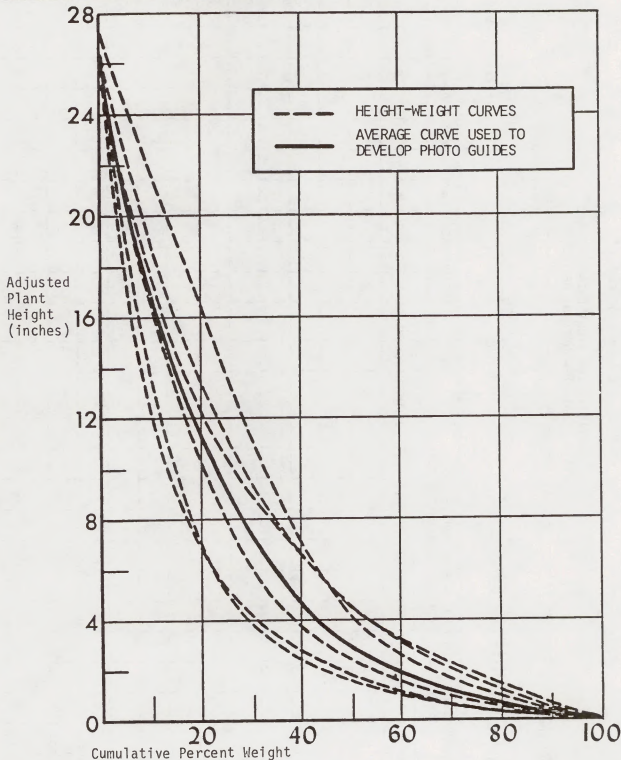
Scientific Name &amp; Code \_\_\_\_\_

Plant Number \_\_\_\_\_ Date \_\_\_\_\_

Segment Number (from top down)	Segment Length (inches)	Dry Weight by Plant Segment (grams)	Cumulative Dry Weight (grams)	Cumulative Percent Weight	Cumulative Height Remaining (inches)	Adjusted Height Remaining (inches)
-	-	-	-	0	21.5	26.0
1	6.5	.9	.9	7.5	15.0	18.1
2	4.0	.9	1.8	15.0	11.0	13.3
3	3.0	.7	2.5	20.8	8.0	9.7
4	2.0	.7	3.2	26.7	6.0	7.3
5	2.0	.9	4.1	34.2	4.0	4.8
6	2.0	1.9	6.0	50.0	2.0	2.4
7	2.0	6.0	12.0	100.0	0	0
	21.5	12.0				

## RANGELAND MONITORING - UTILIZATION STUDIES

EXAMPLE HEIGHT-WEIGHT CURVE USED FOR DETERMINING AVERAGE PLANT HEIGHT FOR THE SIX GRAZED-CLASS PERCENTAGES ON PHOTO GUIDES.



000166

UTILIZATION STUDY DATA  
TWIG LENGTH MEASUREMENT METHOD

78

(INSTRUCTIONS FOR CALCULATIONS ON OTHER SIDE)

000167

CALCULATIONS:

1. AVERAGE ESTIMATED USE PRIOR TO COMPLETION OF FULL ANNUAL GROWTH

$$\frac{\text{Total estimated \% utilization for the individual plants}}{\text{No. of tagged plants}} = \frac{\text{Average estimated use prior to completion of full annual growth}}{\text{}} =$$

2. PERCENT UTILIZATION BY PLANT

$$\frac{\text{Total twig length by plant after full annual growth} - \text{Total twig length by plant after period of use}}{\text{Total twig length by plant after full annual growth}} \times 100 = \frac{\text{Percent utilization}}{\text{}} \times 100 =$$

3. AVERAGE PERCENT UTILIZATION

$$\frac{\text{Total percent utilization for the individual plants}}{\text{No. of tagged plants}} = \frac{\text{Average percent utilization}}{\text{}} =$$

4. TOTAL PERCENT UTILIZATION

$$\frac{\text{Average estimated use prior to completion of full annual growth}}{\text{}} + \frac{\text{Average percent utilization}}{\text{}} = \frac{\text{Total percent utilization}}{\text{}} =$$

5. GROWTH INDEX

$$\frac{\text{Total twig length for all tagged plants after full annual growth}}{\text{No. of twigs measured}} = \frac{\text{Growth index}}{\text{(Average twig length)}} =$$

6. ADJUSTED GROWTH INDEX

$$\frac{\text{Growth index}}{100\% - \text{Average estimated use prior to completion of full annual growth}} \times 100 = \frac{\text{Adjusted growth index}}{\text{}} \times 100 =$$

7. USE INDEX

$$\frac{\text{Total percent utilization}}{100} \times \frac{\text{Adjusted growth index}}{\text{}} = \text{Use index} = \frac{\text{}}{100} =$$

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UTILIZATION STUDY DATA  
TWIG LENGTH MEASUREMENT METHOD

STUDY NUMBER 04N-07W-17-03 DATE 9/1/84 11/30/84 EXAMINER BILLY JOE KIND AND/OR CLASS OF ANIMAL CATTLE

KEY SPECIES ALLOTMENT NAME & NUMBER PUTRA CHICKEN CREEK - 0573 IPASTURE PERIOD OF USE 8/1 to 11/30

MEASUREMENTS AFTER FULL ANNUAL GROWTH													MEASUREMENTS AFTER PERIOD OF USE													Z				
NEAREST 1/2 INCH <input checked="" type="checkbox"/> CENTIHECTER <input type="checkbox"/>																										USE				
TAG													TOTAL EST TWIG													TOTAL BY				
NO	1	2	3	4	5	6	7	8	9	10	11	12	LNTH	USE	1	2	3	4	5	6	7	8	9	10	11	12	LNTH	PLNT		
1	5 1/2	5	6	7	6 1/2	6	7	5 1/2	6	6 1/2			61		10	5 1/2	5	6	7	6	5	5	2	4	2		47 1/2	22		
2	7	5 1/2	6	6 1/2	7	6	6 1/2	5 1/2	7	5 1/2			62 1/2		10	7	5 1/2	6	6 1/2	7	6	6 1/2	4	5	4		57 1/2	8		
3	6 1/2	6	6 1/2	5 1/2	6 1/2	5	6	4	5 1/2	6	5	6 1/2	69		12	6 1/2	6	6 1/2	5 1/2	5	5	5	4	4 1/2	4 1/2	4	4	60 1/2	12	
4	6 1/2	7	6	6 1/2	5 1/2	5	6	5 1/2	4	3 1/2	2		57 1/2	5	11	6 1/2	7	6	6 1/2	4 1/2	4	6	5	3 1/2	2	1		52	10	
5	5 1/2	6	6	6 1/2	5 1/2	6	7	4	6 1/2	5			58		10	5 1/2	6	6	6 1/2	5 1/2	4	3	4	3 1/2	2			46	21	
6	7 1/2	6	5 1/2	6 1/2	7	6	6 1/2	3	5 1/2	6	5 1/2		65		11	7 1/2	6	5 1/2	6 1/2	7	6	6 1/2	3	4	3 1/2	5		60 1/2	7	
7	5 1/2	7	7 1/2	6	7	6 1/2	6	6 1/2	3	5 1/2			60 1/2		10	5 1/2	7	7 1/2	6	7	6 1/2	6	6 1/2	3	5 1/2			60 1/2	0	
8	4	6 1/2	5 1/2	6	6 1/2	4	3	4 1/2	5	6	3	1	55	5	12	4	6 1/2	5 1/2	6	6 1/2	4	3	4 1/2	4	4	2	1/2	50 1/2	8	
9	6	4	4 1/2	5 1/2	5 1/2	5	5 1/2	6	4	7			53		10	6	4	4 1/2	5 1/2	5 1/2	5	5 1/2	6	4	5 1/2			51 1/2	3	
10	6	5	6 1/2	4	3 1/2	7	6	6	6	3			53	5	10	6	5	6 1/2	4	3 1/2	7	6	3	2	2			45	15	
11	6	5 1/2	8	6	6 1/2	5 1/2	7	4 1/2	6	6 1/2			61 1/2		10	6	5 1/2	8	6	6 1/2	5 1/2	7	4	3 1/2	4			56	9	
12	5 1/2	3	7	7 1/2	5	6 1/2	4	6 1/2	5	4 1/2			54 1/2		10	5 1/2	3	7	7 1/2	5	6 1/2	4	6 1/2	5	4 1/2			54 1/2	0	
13	7	7 1/2	6	8	5 1/2	7	4	5 1/2	6 1/2	7	6	5 1/2	75 1/2		12	7	7 1/2	6	8	5 1/2	7	4	5 1/2	6 1/2	5 1/2	6	4	72 1/2	4	
TOTALS													186	15	138														000169	119

NOTES (USE OTHER SIDE OR ANOTHER PAGE, IF NECESSARY)

(INSTRUCTIONS FOR CALCULATIONS ON OTHER SIDE)

CALCULATIONS:

1. AVERAGE ESTIMATED USE PRIOR TO COMPLETION OF FULL ANNUAL GROWTH

$$\frac{\text{Total estimated \% utilization for the individual plants}}{\text{No. of tagged plants}} = \frac{\text{Average estimated use prior to completion of full annual growth}}{\text{of full annual growth}} = \frac{15}{13} = 1\%$$

2. PERCENT UTILIZATION BY PLANT

$$\frac{\text{Total twig length by plant after full annual growth} - \text{Total twig length by plant after full annual growth - period of use}}{\text{Total twig length by plant after full annual growth}} \times 100 = \frac{\text{Percent utilization}}{\text{utilization}} = \frac{61 - 47\frac{1}{2}}{61} \times 100 = 22\%$$

3. AVERAGE PERCENT UTILIZATION

$$\frac{\text{Total percent utilization for the individual plants}}{\text{No. of tagged plants}} = \frac{\text{Average percent utilization}}{\text{utilization}} = \frac{119}{13} = 9\%$$

4. TOTAL PERCENT UTILIZATION

$$\frac{\text{Average estimated use prior to completion of full annual growth} + \text{Average percent utilization}}{\text{percent utilization}} = \frac{\text{Total percent utilization}}{\text{utilization}} = 1 + 9 = 10\%$$

5. GROWTH INDEX

$$\frac{\text{Total twig length for all tagged plants after full annual growth}}{\text{No. of twigs measured}} = \frac{\text{Growth index}}{\text{(Average twig length)}} = \frac{786}{138} = 5.7 \text{ inches}$$

6. ADJUSTED GROWTH INDEX

$$\frac{\text{Growth index}}{100 - \frac{\text{Average estimated use prior to completion of full annual growth}}{\text{percent utilization}}} \times 100 = \frac{\text{Adjusted growth index}}{\text{index}} = \frac{5.7}{100 - 1} \times 100 = 5.8 \text{ inches}$$

7. USE INDEX

$$\frac{\text{Total percent utilization}}{100} \times \frac{\text{Adjusted growth index}}{\text{growth index}} = \text{Use index} = \frac{10 \times 5.8}{100} = .6$$

UTILIZATION STUDY DATA  
COLE BROWSE METHOD

TOT % FORM CLASSES		TOT % AGE CLASSES	
1 - ALL AVAILABLE, LITTLE OR NO HEDGING		S - SEEDLING, < 1/8" DIAM.	
2 - ALL AVAILABLE, MODERATELY HEDGED		Y - YOUNG, 1/8" TO 1/2" DIAM.	
3 - ALL AVAILABLE, SEVERELY HEDGED		M - MATURE, > 1/2" DIAM.	
4 - PARTIALLY AVAILABLE, LITTLE OR NO HEDGING		D - DECADENT, 50% OR MORE DEAD	
5 - PARTIALLY AVAILABLE, MODERATELY HEDGED		TOTAL	
6 - PARTIALLY AVAILABLE, SEVERELY HEDGED			
SUBTOTAL		LEADER USE CLASS	VALUE AVERAGE
		0%	0% LEADER
7 - UNAVAILABLE		1-10%	5% USE
8 - DEAD		11-40%	25%
TOTAL		41-60%	50%
		61-90%	75%
		91-100%	95%
AVERAGE LEADER LENGTH	USE INDEX		

PL	1	2	3	4	5	6	7	8	9	10	LENGTH	MEAS
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
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43												
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46												
47												
48												
49												
50												
TOTALS												

TOTAL LENGTH = AVERAGE LEADER  
 NO LEADERS MEAS LENGTH =

IF NECESSARY)  
 Illustration 17  
 Page 2

Illustration 17  
Page 3

DEPARTMENT OF THE INTERIOR  
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UTILIZATION STUDY DATA  
COLE BROWSE METHOD

STUDY NUMBER <b>135-27E-11-05</b>	DATE <b>2/28/84</b>	EXAMINER <b>SUZIE CLUMP</b>
ALLOTMENT NAME & NUMBER <b>PURPLE RIDGE - 1234</b>	PASTURE <b>MAHOGANY</b>	
KEY SPECIES (KIND AND/OR CLASS OF ANIMAL) <b>CEMO2 CATTLE</b>		PERIOD OF USE <b>11/1 to 2/28</b>

FORM CLASS														FORM CLASS													
AGE CLASS														AGE CLASS													
INDI	1	2	3	4	5	6	7	8	9	10	11	12	13	INDI	1	2	3	4	5	6	7	8	9	10	11	12	13
1		X												126	X												
2			X											127	X												
3	X													128	X												
4		X												129	X												
5	X													130	X												
6			X											131													
7			X											132													
8				X										133													
9					X									134													
10	X													135													
11	X													136													
12				X										137													
13			X											138													
14	X													139													
15	X													140													
16								X						141													
17	X								X					142													
18	X								X					143													
19	X								X					144													
20		X								X				145													
21			X							X				146													
22			X							X				147													
23							X							148													
24	X							X						149													
25	X								X					150													

TOT % FORM CLASSES		TOT % AGE CLASSES		TOTAL	
13	43	1	12	1705	
6	20	9	45		
0	0	12	46		
4	13	2	1		
2	7	126	100		
1	3				
26	-				
2	7				
2	7				
130	100				
AVERAGE LEADER LENGTH 7 inches		USE INDEX 1.9		000173	

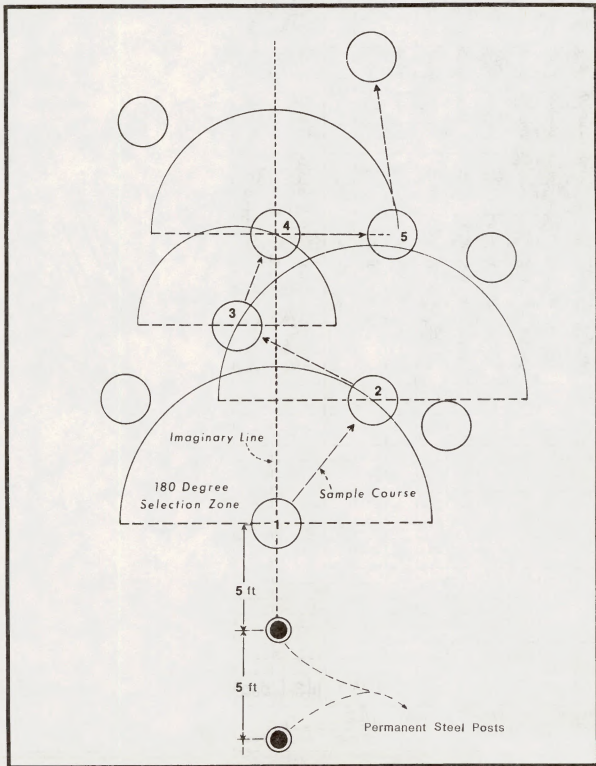
LEADER LENGTH											NO	NOTES	COS	ANOTHER PAGE
nearest 1/2 inch												IF NECESSARY)		
IPL	1	2	3	4	5	6	7	8	9	10	LENGTH	MEAS		
1	7	6 1/2	8	6 1/2	3	6					37	6		
2	8	6	7 1/2	6 1/2	5	7	6	6 1/2			52 1/2	8		
3	6 1/2	7	8	5	7 1/2	7	8	5 1/2	6	7 1/2	68	10		
4	8	6 1/2	7	7	7	7 1/2	6 1/2	7	6	6	68 1/2	10		
5	7 1/2	8	6	7	7	6 1/2	5	7 1/2	7		61 1/2	9		
6	7 1/2	7	8	6 1/2	9						38	5		
7	7	9	8 1/2	7	8	6 1/2	7				53	7		
8	6	7 1/2	7								20 1/2	3		
9														
10	5 1/2	7 1/2	6	8	8 1/2	7	9	7			58 1/2	8		
11	7 1/2	8	6	9	5 1/2	6	8	8	8		66	9		
12														
13	7 1/2	9	9	6 1/2	7	8	6	7	9	7	76	10		
14	6 1/2	6	7	7	6 1/2	5					38	6		
15	6 1/2	7	8	5	7						33 1/2	5		
16														
17	5 1/2	8	7	6 1/2							27	4		
18	8	7	8	8	6 1/2	4	7 1/2	7	7	7	70	10		
19	9	8 1/2	8 1/2	6	7	6 1/2	5	7	6	6	69 1/2	10		
20	8	8 1/2	7	6							29 1/2	4		
21	7	9	7 1/2	8	6	5 1/2	7				50	7		
22	7	8 1/2	6	6 1/2	7	6 1/2	6	6	6		59 1/2	9		
23														
24	7	6 1/2	5	4 1/2	7	9	9	8	7	8	71	10		
25	8 1/2	9	7 1/2	7	7	7	8	8 1/2	6		68 1/2	9		
26	8 1/2	6 1/2	9	8 1/2	5	9	6 1/2	8	8	8	77	10		
27	6 1/2	7	9	8 1/2	7	7	7 1/2	7	4	8	71 1/2	10		
28	5	7 1/2	8	8	8	7	7 1/2	6	9		66	9		
29	9	9	8 1/2	7	7	8					48 1/2	6		
30	8	6	6 1/2	6	6 1/2	8	7	7			55	8		
31														
32														
33														
34														
35														
36														
37														
38														
39														
40														
41														
42														
43														
44														
45														
46														
47														
48														
49														
50														
TOTALS											1434	202		
TOTAL LENGTH											1434			
AVERAGE LEADER											7			
IND LEADERS MEAS											202			
LENGTH														

Illustration 17  
Page 4

## RANGELAND MONITORING - UTILIZATION STUDIES

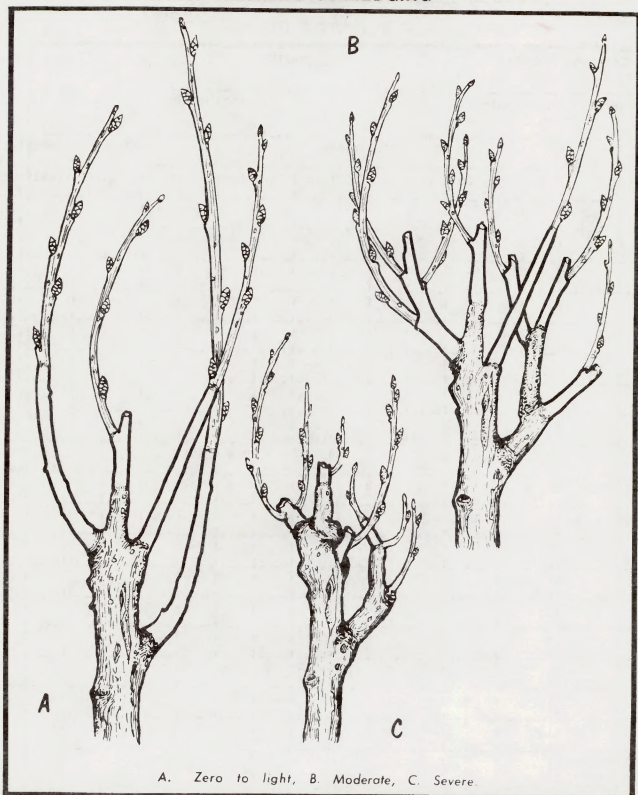
### COLE BROWSE METHOD - TRANSECT SCHEMATIC

## TECHNIQUE FOR SELECTING THE NEAREST PLANT



RANGELAND MONITORING - UTILIZATION STUDIES

DEGREES OF HEDGING



A. Zero to light, B. Moderate, C. Severe



#### Calculating Average Utilization by Species

1. For each species, multiply the number of browse plants tallied in each percentage block by the percent indicated in the column heading (0, 10, 20, 30, etc.). Add the figures from each block to determine total percent utilized.
2. Add the dot tallies for each browse species to determine the total number of plants sampled of that species.
3. Calculate the average percent utilization for each species by dividing the total percent utilized by the total number of plants.

#### Age Class Summary Calculations

Add the dot tallies for each age class. Because the age class is determined for 100 plants on the transect, these totals represent the percent composition by age class for the browse portion of the plant community.

#### Form Class Summary Calculations

Add the dot tallies for each form class. Because the form class is determined for 100 plants on the transect, these totals represent the percent composition by form class for the browse portion of the plant community.

#### Calculating Composition by Species

Add the form class dot tallies for each browse species. Because the form class is determined for 100 plants on the transect, the totals represent the species composition percentages for the browse portion of the plant community.

Illustration 20  
Page 3

UNITED STATES  
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UTILIZATION STUDY DATA  
EXTENSIVE BROWSE METHOD

STUDY NUMBER 27N-01E-19-01	DATE 3/31/84	EXAMINER SALLY CLUMP
ALLOTMENT NAME & NUMBER Window Rock - 2129	IPASTURE BOULDER	
KIND AND/OR CLASS OF ANIMAL SHEEP	PERIOD OF USE 1/15 to 3/31	

SPECIES	PERCENT UTILIZATION											TOTAL %	NUMBER OF PLANTS UTILIZED	AVERAGE %
	0	10	20	30	40	50	60	70	80	90	100			
PUTR2												3110	60	52
CEMO2												1020	44	23
CHV18												280	23	12
ARTRV												130	14	9

SPECIES	AGE CLASS				FORM CLASS								IND PLNT (AND % COMP)	
	S	Y	M	D	1	2	3	4	5	6	7	8		
PUTR2													19	
CEMO2													44	
CHV18													23	
ARTRV													14	

TOT NO PLANTS (AND % COMP)	5	25	66	4	17	12	2	9	3	2			100	
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NOTES (USE OTHER SIDE OR ANOTHER PAGE, IF NECESSARY)

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## RANGELAND MONITORING - UTILIZATION STUDIES

## APPENDIX

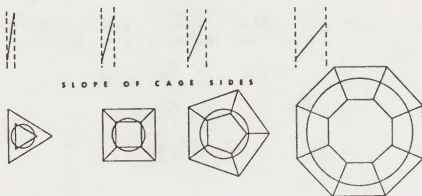
KINDS OF UTILIZATION CAGES

Following are some examples of kinds of cages that can be constructed and used for utilization and production studies. There are many other kinds of cages that will do the job just as well. No specific cage is recommended.

CAGE TYPE 1

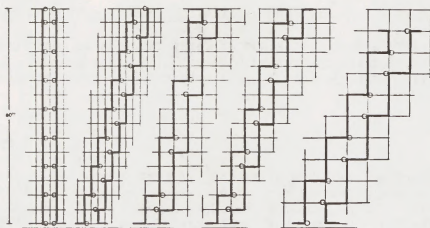
Folding cages are adaptable to plots of different sizes. The basic construction employs panels of welded wire, hinged together by No. 9 wire threaded through a series of wire loops at the edges of each panel. The 4-sided cage constitutes the basic design, but the number of panels can be increased to enclose larger areas. A 4-panel cage, 5 ft. sq., accomodates a 9.6 sq. ft. plot, 5 panels accomodate a plot twice that size, and 8 panels accomodate a 96 or 100 sq. ft. plot. Procedures for cutting panels from different types of welded wire are shown on page 2. Cages with an even number of panels will fold flat if the panels are of equal size. If an odd number of panels are used, one hinge wire must be removed to permit the cages to fold flat.

Below are diagrams of four cage structures produced by varying the number of panels. For these cages, the basic panel would be of welded 4 by 4-inch



wire mesh cut on the following dimensions: base, 5 feet; height, 5 feet; top, 32 inches. Areas enclosed by circles within each diagram (left to right) correspond to plots of 4.8, 9.6, 19.2, and 96 square feet respectively.

## RANGELAND MONITORING - UTILIZATION STUDIES

CAGE TYPE 1 (continued)

<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>	<u>E</u>
90° cut 2" x 4" mesh, 11/11 gage, galvanized.	76° cut 2" x 4" mesh, 11/11 gage, galvanized.	76° cut 4" x 4" mesh, 10/10 gage, galvanized.	71.5° cut 4" x 4" mesh, 10/10 gage, galvanized.	63.3° cut 6" x 6" mesh, 9/9 gage, galvanized.

The above are diagrams for cutting 5 by 5-foot panels from three types of welded wire. Loops are formed from horizontal wires as shown - other wires between panels are cut off.

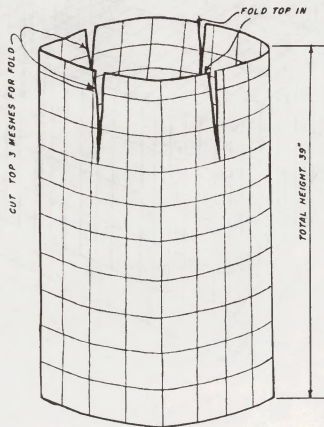
CAGE TYPE 2

A rigid steel post cage can be constructed by driving four steel posts in the ground to mark off the area to be protected. Make the posts sturdy by bracing from one post to another around the perimeter of the cage. Encircle this frame with either net or barbed wire. These cages are very stable but they are difficult to move.

## RANGELAND MONITORING - UTILIZATION STUDIES

CAGE TYPE 3

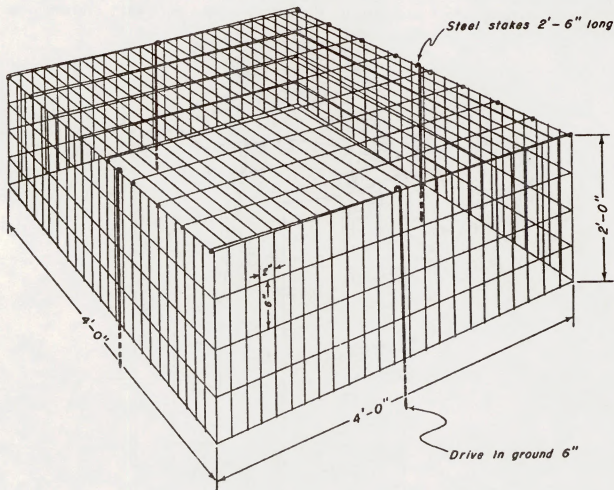
Igloo-shaped wire cages are light in weight, low in cost, portable, and easily placed. The cages are made in sets of four and can be nested. Use 6-inch mesh, 39 inches high. Wire lighter than 11-1/2 gage is unsuitable. To make four nesting cages: lengths of field fence are cut with 23, 24, 25, and 26 meshes intact. Each length is formed into a cylindrical shape and fastened by using the cut ends as ties, except those of the three upper (larger) meshes. The horizontal wires of the three upper meshes are cut at intervals of 90 degrees so that four nearly-equal flaps are formed. These are bent inward and wired by their cut ends to make the top and complete the cage. A fencing tool and 8-inch lineman's pliers are suitable tools. In use, four 18-inch stakes of 1/2 inch reinforcing iron are driven diagonally inward over the bottom wire so that the cage is held taut and close to the ground. Small mesh wire one foot high around the bottom of the cage will exclude rabbits.



## RANGELAND MONITORING - UTILIZATION STUDIES

CAGE TYPE 4

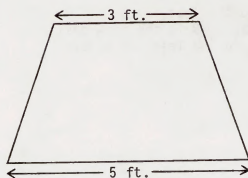
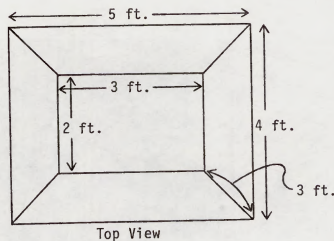
These cages are 4 feet square. They are constructed of No. 9 galvanized wire. Every intersection is electronically welded. Cages are held in place with four pointed steel stakes; one on each side. These cages are easily transported from place to place and fold completely flat.



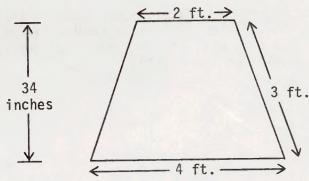
## RANGELAND MONITORING - UTILIZATION STUDIES

CAGE TYPE 5

These cages are 4 feet by 5 feet in size. They are constructed with 40 feet of 1/2 inch iron rod and 20 feet of 39 inch galvanized mesh wire. The size of the mesh is discretionary. The joints of the rod frame are welded and the wire is tied to the frame. The cages are held in place with four stakes, at least one foot long, with hooks on the top. These cages are sturdy and are stackable for storage and transporting.



Side View

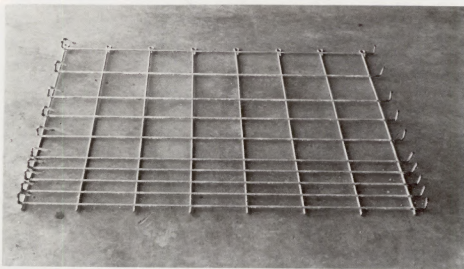


End View

## RANGELAND MONITORING - UTILIZATION STUDIES

CAGE TYPE 6

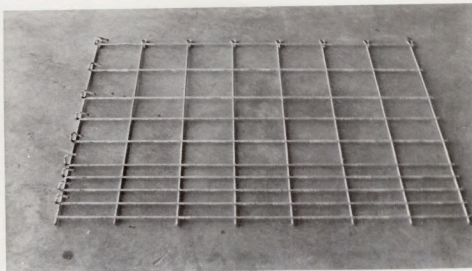
These cages are about 4 feet square. They are constructed of prewelded mesh panels made with 1/4 inch rod. The sides of the cages are made by cutting a 32 inch x 16-foot panel (hog panel) into 4 equal parts. The top is one-fourth of a 52 inch x 16-foot panel. An acetylene torch can be used to cut the panels to the desired length. The cut ends are bent into different hooks which hold the cages together. Three types of panels are used for the sides of the cages and one for the top. This type cage can be assembled in less than 5 minutes. The corners all lock together and do not have to be wired. Steel posts should be put on two sides of a cage to prevent livestock from pushing it around. Construction is strong enough to withstand cattle rubbing.



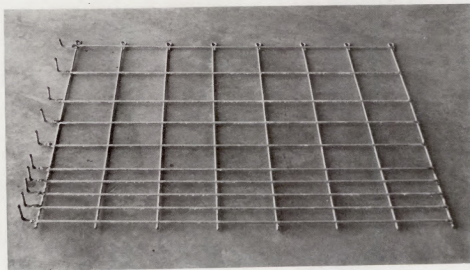
Picture 1 - Panel type 1 (32 inches x about 4 feet).

One of these panels is needed for each cage. Note the hook design on both ends of this panel (corner hooks on the left and closing hooks on the right).

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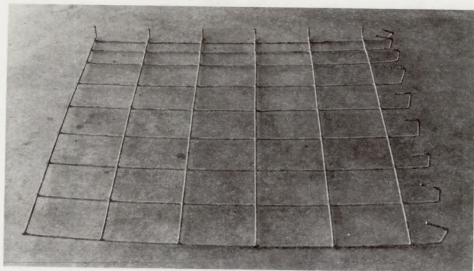


Picture 2 - Panel type 2 (32 inches x about 4 feet).  
Two of these panels are needed for each cage. Note the hook design (corner hooks) on the left end of the panel.

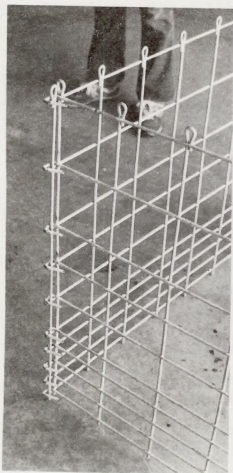


Picture 3 - Panel type 3 (32 inches x about 4 feet).  
This is the closing panel. One of these panels is needed for each cage. Note the hook design (closing hooks) on the left end of this panel. The right angle hooks on this panel and those shown on the panel in picture 1 overlap to form a channel for a rebar rod to be thrust through to close the cage as shown in picture 7.

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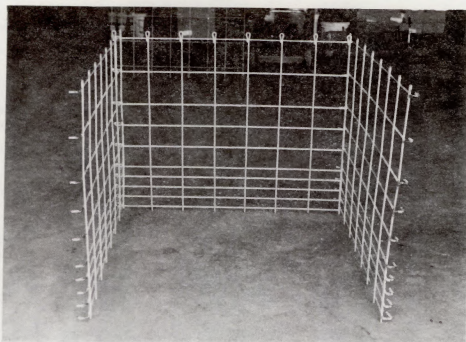


Picture 4 - Top panel (about 4 feet square). One of these panels is needed for each cage. Note the hook design along two sides of this panel.

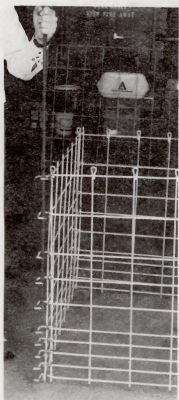


Picture 5 - Shows how two panels are locked together using the corner hooks. Three corners of the cage will look like this. Note that the hooks are on the outside of the cage.

RANGELAND MONITORING - UTILIZATION STUDIES



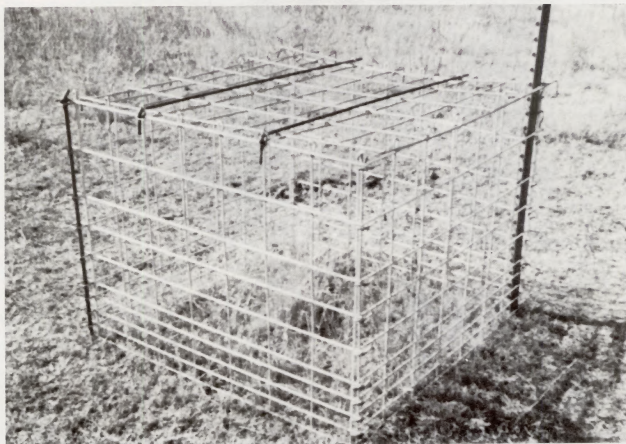
Picture 6 - Shows three panels (panel type 1 on the left and panel type 2 in the center and on the right) locked together. The cage is ready to have the closing panel (panel type 3) put in place.



Picture 7 - Shows how the closing panel (panel type 3) is locked to panel type 1 with a rebar rod being thrust through the closing hooks. The rod can be long enough to extend into the ground if desired.

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Picture 8 - Completely assembled cage. The top panel is hooked on one side of the cage, laid across the cage, and held in place with two 1/4 inch locking rods pushed through loops along the top of side panels of the cage.

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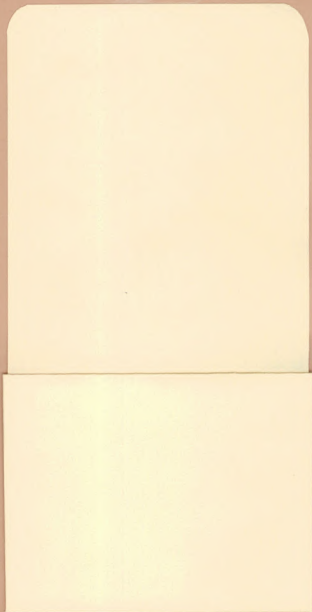
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